The Iron Age

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A Review of the Hardware, Iron and Metal Trades.

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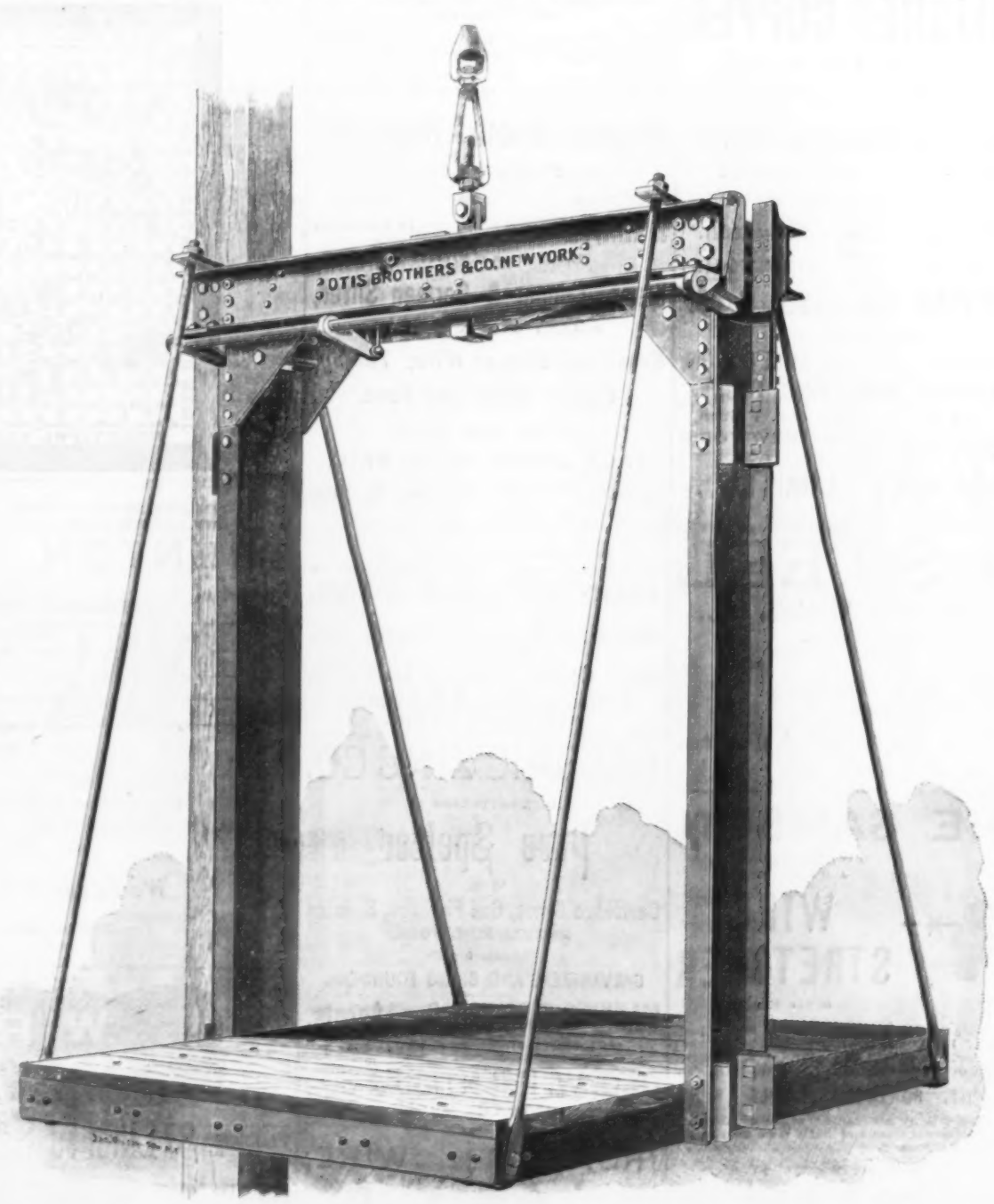
Improved Mining or Furnace Platform.

Messrs. Otis Brothers & Co., 36-38 Park row, New York, are turning out the improved mining or furnace platform shown in the engraving. It is constructed of heavy channel iron, well braced and riveted, calculated to stand rough usage and continuous, heavy work. A distinguishing feature is its safety catch, which is clearly shown in the engraving, and is on the wedge principle, positive in action and graduating the stoppage of the platform in case of breakage or derangement of cable or connections. The guideway, which also forms the post, is 3 x 8 inches or larger, according to the size of the platform. At a recent test of the safety catch and strength of the platform a weight of 6180 pounds was placed on it and hoisted to a hight of 50 feet (in the experimental tower which Messrs. Otis Brothers & Co. have at their works). The cable was cut, and the platform dropped only 9 inches. The platform structure and the safety device were found to be in perfect condition. This test was repeated several times with the same result. Messrs. Otis Brothers & Co. have recently placed 12 of these platforms at the New York Aqueduct, in connection with their hoisting engines, and they may there be seen in constant use, performing exceptionally rough and heavy work.



NEW MINING AND FURNACE PLATFORM, BUILT BY OTIS BROTHERS & CO., NEW YORK.

New Applications of the Mechanical Properties of Cork.*

It would seem difficult to discover any properties in a substance so familiar as cork, and yet it possesses qualities which distinguish it from all other solid or liquid bodies, namely, its power of altering its volume in a very marked degree in consequence of change of pressure. All liquids and solids are capable of cubical compression or extension, but to a very small extent; thus water is reduced in volume by only $\frac{1}{21000}$ part by the pressure of 1 atmosphere. Liquid carbonic acid yields to pressure much more than any other fluid, but still the rate is very small. Solid substances, with the exception of cork, offer equally obstinate resistance to change of bulk; even india-rubber, which most people would suppose capable of very considerable change of volume, we shall find is really very rigid. Extension in like manner does not alter the volume of india-rubber. In this glass tube is a piece of solid round rubber which nearly fills the bore. The lower end of the rubber is fixed in the bottom of the tube and the upper end is connected by a fine cord to a small windlass, by turning which I can stretch the rubber. I fill the tube to the brim with water and throw an image of it on to the screen. If stretching the rubber either increases or diminishes its volume the water in the tube will either overflow or shrink in it. I now stretch the rubber to about 3 inches, or one-third of its original length, but you cannot see any appreciable movement in the water level; hence the volume of the rubber has not changed. Metals when subjected to pressures which exceed their elastic limits so that they are permanently deformed, as in forging or wire-drawing, remain practically unchanged in volume per unit of weight.

I have here a pair of common scales. To the under sides of the pans I can hang the various specimens that I wish to examine; underneath these are small beakers of water which I can raise or lower by means of a rack and pinion. Substances immersed in water lose in weight by the weight of their own volume of water; hence if two substances of equal volume balance each other in air they will also balance when immersed in water; but if their volumes are not the same, then the substance having the smaller volume will sink, because the weight of water it displaces is less than that displaced by the substance with the larger volume. To the scale on your left hand is suspended a short cylinder of ordinary iron, and to the right-hand scale a cylinder of ordinary copper. They balance exactly. I now raise the beakers and immerse the two cylinders in water; you see the copper cylinder sinks at once, and I know by that that copper has a smaller volume per pound than iron, or, as we should more commonly say, it is heavier than iron. I now detach the copper cylinder, and in its place hang on the iron one, which is made of the same bar as its fellow cylinder, but forced while red-hot into a mold by a pressure of 60 tons per square inch and allowed to cool under that pressure. The two cylinders balance, as you see. Has the volume of the iron in the compressed cylinder been altered by the rough treatment it has received? I raise the beakers, immerse the cylinders, the balance is not destroyed; hence we conclude that although the form has been changed the volume has remained the same. I substituted for the hot, compressed cylinder one pressed into a mold while cold and held there for some time with a load of 60 tons per square inch; the balance is not destroyed by immersion; hence the volume has not been altered. I can repeat the experiments with these copper cylinders and the result will be found the same. Extension also is incapable of appreciably altering the density of metals. I attach to the scales two specimens of iron taken from a bar which had been torn asunder by a steady pull. One specimen is cut from the portion where it had not been strained, and the other from the very point where it had been gradually drawn out and fractured. The specimens balance, I immerse them, you see the balance is not destroyed; hence the volume of iron has not been changed appreciably by extension.

But cork behaves in a very different manner. I place this cylinder of cork into just such a brass tube as served to restrain the india-rubber, and apply pressure to it in the same way; you see I can readily compress the cork, and when I release it it expands back to its original volume; the action is a little sluggish on account of the friction of the cork against the sides of the tube. In this case, therefore, a very great change in the volume of the material has been easily effected. But, although solids evidently do not change sensibly in bulk after having been released from pressures high enough to distort them permanently, yet while actually under pressure the volumes may have been considerably altered. As far as I am aware, this point has not been determined experimentally for metals, but it is very easy to show that india-rubber does not change. I have here some of this substance, which is so very slightly lighter than water that, as you see, it only just floats in cold water, but sinks in hot. If I could put it under considerable pressure while afloat in cold water, then, if its volume became sensibly less, it ought to sink. In the same way, if I load a piece of cork and a piece of wood so that they barely float, if their volumes alter they ought to sink.

In this strong upright glass tube I have at the top a piece of india-rubber, immediately below it a piece of wood, and below that a cork. The wood and the cork are loaded with metal sinkers to reduce their buoyancy. The tube is full of water and is connected to a force pump by means of which I can impose a pressure of over 1000 pounds per square inch. The image of the tube is now thrown on the screen and the pressure is being applied. You see at once the cork is beginning to shrink in all directions, and now its volume is so reduced that it is incapable of floating and sinks down to the bottom of the tube. The india-rubber is absolutely unaffected, the wood does contract a little, but not sufficiently to be visible to you or to cause it to sink. I open a stopcock and relieve the pressure; you see that the cork instantly expands, its buoyancy is restored and it floats again. By alternately applying and taking off the pressure I can produce the familiar effect so well known in the toy called "the bottle imps." It is this singular property which gives to cork its value as a means of closing the mouths of bottles. Its elasticity has not only a very considerable range, but it is very persistent. Thus in the better kind of corks used in bottling champagne and other effervescing wines you are all familiar with the extent to which the corks expand the instant they escape from the bottles. I have measured this expansion and find it to amount to an increase of volume of 75 per cent., even after the corks have been kept in a state of compression in the bottles for 10 years. If the cork be steeped in hot water the volume continues to increase till it attains nearly three times that which it occupied in the neck of the bottle. When cork is subjected to pressure either in one direction, as in this lever press, or from every direction, as when immersed in water under pressure, a certain amount of permanent deformation, or "permanent set," takes place very quickly. This property is common to all solid elastic substances when strained beyond their elastic limits, but with cork the limits are comparatively low.

In considering the properties of most substances our search for the cause of these properties is baffled by our imperfect powers and the feeble instruments we possess for investigating molecular structure. With cork, happily, this is not the case; an examination of its structure is easy, and perfectly explains the cause of its peculiar and valuable properties. The difference between the arrangement of the cells or tissue forming the woody part of the tree and the bark is easily shown. I have here three metal sockets, supported over a shallow wooden tray. Into them are fitted, first, a cork cut out of the bark in a vertical direction; next, a cork cut in a radial direction; and, lastly, a piece of common yellow pine. By means of my force pump I apply a couple of atmospheres of hydraulic pressure. I project an image of the apparatus on the screen, and you see the water has made its way through the wood and through the cork cut in the radial direction, while the cork cut in the vertical direction is impervious.

The cells of the cork are filled with gaseous matter, which is very easily extracted, and which has been analyzed for me by Mr. G. H. Ogston, and proved to be common air. From measurements made by Mr. Ogston I find that the air occluded in the cork amounts to about 53 per cent. of its volume. The facility with which the air escapes, compared with the impermeability of cork to liquids, is very remarkable. Cork consists, practically, of an aggregation of minute air vessels having very thin, very water-tight and very strong walls, and hence, if compressed, we may expect the resistance to compression to rise in a manner more like the resistance of gases than the resistance of an elastic solid such as a spring. In a spring the pressure increases in proportion to the distance to which the spring is compressed, but with gases the pressure increases in a much more rapid manner—that is, inversely as the volume which the gas is made to occupy. But from the permeability of cork to air it is evident that, if subjected to pressure in one direction only, it will gradually part with its occluded air by effusion—that is, by its passage through the porous walls of the cells in which it is contained. This fact can be readily demonstrated by the lever press which I have used, for, if the brass cylinder containing the cork be filled with soap and water and pressure be then applied, minute bubbles will be found to collect on the surface, and their formation will go on for many hours.

On the other hand, if cork be subjected to pressure from all sides, such as operates when it is immersed in water under pressure, then the cells are supported in all directions, the air in them is reduced in volume, and there is no tendency to escape in one direction more than another. An india-rubber bag, such as this, distended by air, bursts, as you see, if pressed between two surfaces; but if an india-rubber cell be placed in a glass tube and subjected to hydraulic pressure it is merely shriveled up; the strain on its walls is actually reduced. To take advantage of the peculiar properties of cork in mechanical applications it is necessary to determine accurately the law of its resistance to compression, and for this purpose I instituted a series of experiments of this kind. Into a strong iron vessel of 5½ gallons capacity I introduced a quantity of cork, and filled the interstices full of water, carefully getting out all the air. I then proceeded to pump in water until definite pressures up to 1000 pounds per square inch had been reached, and at every 100 pounds the weight of water pumped in was determined. In this way, after many repetitions, I obtained the decrease of volume due to any given increase of pressure. The observations have been plotted in the form of a curve, which you see on the diagram on the wall. The base line represents a cylinder containing 1 cubic foot of cork divided by the vertical lines into 10 parts; the black horizontal lines according to the scale on the left hand represent the pressures in pounds per square inch which were necessary to compress the cork to the corresponding volume. Thus to reduce the volume to one-half required a pressure of 250 pounds per square inch. At 1000 pounds per square inch the volume was reduced to 44 per cent.; the yielding then became very little, showing that the solid parts of the cells had nearly come together, and this corroborates Mr. Ogston's determination that the gaseous part of cork constitutes 53 per cent. of its bulk. The engineer, in dealing with a compressible substance, requires to know not only the pressure which a given change of volume produces, but also the work which has to be expended in producing the change of volume. The work is calculated by multiplying the decrease of volume by the mean pressure per unit of area which produced it. The ordinates of the dotted curve on the diagram, with the corresponding scale of foot pounds on the right-hand side, are drawn equal to the work done in compressing a cubic foot of cork to the several volumes marked on the base line. I have not been able to find an equation to the pressure curve; it seems to be quite irregular, and hence the only way of calculating the effects of any given change of volume is to measure the ordinates of the curve constructed by actual experiment. As may be supposed, the pressures indicated by experiment are not nearly so regular and steady as corresponding experiments on a gas would be, and the actual form of the curves will depend on the quality of the cork experimented on.

The last point of importance in this inquiry relates to the permanence of elasticity in cork. So far as preservation of elasticity during years of compression is concerned, we have the evidence of wine corks to show that a considerable range of elasticity is retained for a very long time. With respect to cork subjected to repeated compression and extension, I have very little evidence to offer beyond this—that cork which had been compressed and released in water many thousand times had not changed its molecular structure in the least, and had continued perfectly serviceable. Cork which has been kept under a pressure of 3 atmospheres for many weeks appears to have shrunk to from 80 to 85 per cent of its original volume.

I will conclude this lecture by bringing under your notice two novel applications of cork to the arts. Before the lecture-table stands a water-raising apparatus called a hydraulic ram. The structure of the machine is shown by a diagram on the wall. The ram consists of an inclined pipe which leads the water from a reservoir into a chamber which terminates in a valve opening inward. Branching up from the chamber is a passage leading to a valve opening outward and communicating with a regulating vessel which is usually filled with air, but which I prefer to fill with cork and water. Immediately beyond the inner valve is inserted a delivery-pipe, which is laid to the spot to which the water has to be pumped, in this case to the fountain jet in the middle of this pan. The action of the ram is as follows: The outer valve, which opens inward, is, in the first instance, held open, and a flow of water is allowed to take place through it down the pipe and chamber. The valve is then released, and is instantly shut by the current of water which is thus suddenly stopped, and, in consequence, delivers a blow similar to that produced by the fall of a hammer on an anvil, and just as the hammer jumps back from the anvil so does the water recoil back to a small extent along the pipe. During this action, first, a certain portion of water is forced by virtue of the blow through the inner valve, opening outward, into the cork vessel, and so to the delivery-pipe, and instantly afterward the recoil causes a partial vacuum to form in the body of the ram, and permits the atmospheric pressure to open the outer valve and re-establish a rush of water as soon as the recoil has expended itself. In the little ram before you this action, which it has taken so long to describe, is repeated 140 times in a minute.

The ram is now working. You hear the regular pulses of the valve, and you see a jet of water rising some 10 feet into the air. I throw the electric light on the water, and I ask you to notice the regularity of the flow. You can, indeed, detect the pulses of the ram in the fountain, but that is because I am only using a regulating vessel of the same capacity as that generally used for air, and you will recollect that 44 per cent. of the substance of cork is solid and inelastic. By closing a cock I can cut off the cork vessel from the ram; you see the regularity of the jet has disappeared: it now goes in leaps and

*From a paper read at the Royal Institution of Great Britain, April 9, 1886, by William Anderson, M. Inst. C. E., M. R. I.

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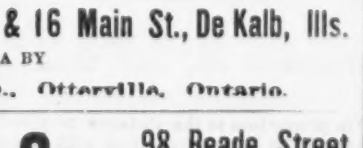

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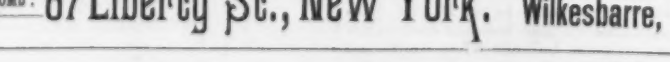

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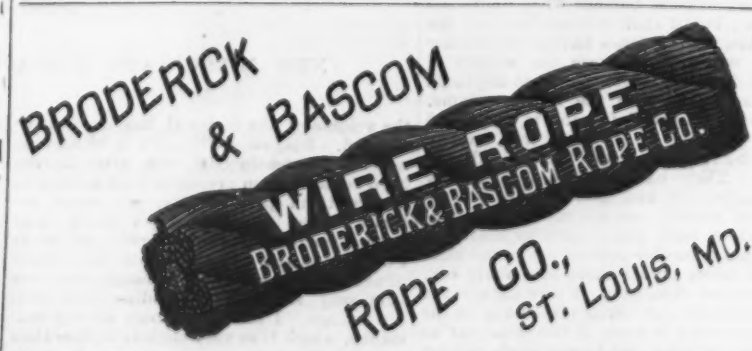

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bounds. This demonstrates that the elasticity of cork is competent to regulate the flow of water. When air is used for this purpose the air vessel has to be filled, and, with most kinds of water, the supply has to be kept up while the ram is working, because water under pressure absorbs air. For this purpose a "sniff-valve" is a necessary part of all rams. It is a minute valve opening inward, placed just below the inner valve; at each recoil a small bubble of air is draw in and passed into the air vessel. This sniff-valve is a fruitful source of trouble. Its minuteness renders it liable to get stopped up by dirt; it must not, of course, be submerged, and, if too large, it seriously affects the duty performed by the ram. The use of cork gets rid of all these difficulties, no sniff-valve is needed, the ram will work deeply submerged, and there is no fear of the cork vessel ever getting empty. The duty which even the little ram before you has done is 65 per cent., and larger ones have reached 80 per cent.

The second novel application of cork is for the purpose of restoring a portion of the energy of the recoil of cannon, for the purpose of expending it afterward in running them out. The result of the explosion of gunpowder in a gun is to drive the shot out in one direction, and to cause the gun to recoil with equal energy the opposite way. To restrain the motion of the gun "compressors" of various kinds are used, and in this country for modern guns they are generally hydraulic—that is to say, the force of recoil is expended in causing the gun to mount an inclined plane, and at the same time in driving a piston into a cylinder full of water, the latter being allowed to squeeze past the piston through apertures, the areas of which are either fixed or capable of being automatically varied as the gun recedes; or else the water is driven out of the cylinder through loaded valves. As a rule, the gun is moved out again into its firing position by its weight causing it to run down the inclined plane, up which it had previously recoiled. For naval purposes, however, this plan is inconvenient, because the gun will not run out to windward if the vessel is heeling over, on account of the inclined plane becoming more horizontal, or even inclined in the reverse direction, and should the ship take a permanent list, from a compartment getting full of water, the inconvenience might be very considerable. In land service guns, when mounted in barbette, the rising of the gun exposes it and the loading detachment more to the enemy's fire, and in both cases, when placed in ports or embrasures, the ports must be higher than if the gun recoiled horizontally, and will therefore offer a better mark to the enemy's fire, especially that of machine guns, while the sudden rise of the gun in recoiling imposes a severe downward pressure on the deck or on the platform.

To obviate these disadvantages the gun is mounted on a carriage composed of two hydraulic cylinders united so as to form one piece. The carriage slides on a pair of hollow ways, and also on to a pair of fixed rams, the rear ends of which are attached to the piece forming the rear of the mounting. There are water passages down the axes of the rams, and these communicate through an automatic recoil-valve, opening from the cylinders, with the two hollow slides. There is a second communication between the cylinders and slides by means of a cock which can be opened or shut at pleasure. The hollow slides are packed full of cork and water, the latter also completely filling the cylinders, rams and various connecting passages. By means of a small force pump enough of water can be injected to give the cork so much initial compression as will suffice to run the gun out when the slides are inclined under any angle which may be found convenient. When the gun is fired the cylinders are driven on to the rams, and the water in the cylinders is forced through the hollow rams into the cork and water vessels formed by the slides, and the cork is compressed still further. When the recoil is over, the automatic recoil valve closes, and the gun remains in its rearward position ready for loading. As soon as loaded the running-out cock is opened, and the expansion of the cork drives the water from around it into the cylinders, and so forces the gun out. If it be desired to let the gun run out automatically immediately after recoil, it is only necessary to leave the running-out cock open, and the water forced among the cork by recoil returns instantly to the cylinders, and runs the gun out quicker than the eye can follow the motion. The merit of cork is its extreme simplicity and trustworthiness. By mixing a certain proportion of glycerine with the water it will not freeze in any ordinary cold weather.

Automatic Sprinklers, Rates and Contingencies.

The *American Exchange and Review* says: There is now an experience of about nine years in the sprinkler fixtures as defensive against fire in New England mills. The New England Fire Insurance Exchange has a standing Committee on Factory Improvement and Protection, and at the last meeting of the Exchange this committee made a report especially recommending one sprinkler—a dry-pipe system:

"May 1, 1886, there were 929 establishments protected by the Grinnell Sensitive Automatic Sprinklers, with an insurable value of $200,000,000. Losses on the property protected by this sprinkler from May 1, 1882, the time when the Providence Steam and Gas-Pipe Company commenced to introduce it in the place of the Parmelee sprinkler, to May 1, 1886, amounted to $12,497.92. Number of fires where no claim was made, 99; where claim was made, 20. Total number of fires, 119. Average loss to one fire, $105.02, and an average of one fire to every eight establishments. The report of the largest insurance company doing business on this class of property reports fires on the property protected by automatic sprinklers of all kinds from 1877 to 1886: Number of fires, 224; average loss per fire, $382.36."

Our contemporary adds: The committee does not appear yet to regard such rate of fire loss as sufficiently established to warrant the reduction of insurance to, say $2000 or $3000 per establishment. A special com-

mittee is, however, recommended, to be called Factory Protection and Automatic Sprinkler Committee, which is to have consideration of all questions connected with the subject. The sprinkler has not become an absolute reducer of jeopardy, being itself subject to contingencies. The committee put the following as absolute conditions for effective operation:

"1. A sprinkler should cover every part of the building, including stairways, elevators, closets and all concealed spaces.

"2. A supply of water, valves all open, and pressure on the pipes, whatever it may be, free and in working order."

Further, it is said:

"The whole sprinkler system may be the best, the water supply ample, and yet if the main valve is closed the whole apparatus is worse than useless. With all the care used, the number of valves found closed is surprising. Sprinkler people have been working to devise some simple arrangement by which the closing of the valve would be detected and the alarm given, but as yet without the desired effect. A water-gauge above the valve and set-cocks may be of some value, but are not to be depended upon. At present the greatest care should be observed, and the main valve should be strapped open by a riveted leather strap, the strap passing around the pipe and a spoke of the hand-wheel used for opening the valve, and under no circumstance should a left-hand valve be allowed in a sprinkler system * * * In order to reduce the chances for accident to a minimum two sources of water supply afford the best protection. The desired pressure may be constantly maintained by a tank located above the highest point to be protected by sprinklers, by reservoir pressure through main streets, by steam pumps having automatic-pressure regulations, and by air-pressure tanks. The size and location of the elevated tank will depend upon various conditions, including that of auxiliary supplies, but there should not be less than 3000, and for a system of fair size 5000, gallons, and the bottom of the tank should not be less than 10 feet above the highest point to be protected. Steam pumps should be duplex and of from 250 to 500 gallons capacity; should be connected automatically and with a drip, so that the pumps may be always in working order. The size of the pump depends on the size of the property to be protected. An air-pressure tank consists of an iron tank of desired capacity about two-thirds full of water, the remaining space filled with compressed air under pressure of about 80 pounds. This may be an important apparatus for supplying pressure on the top of high buildings in cities. A force pump may also be used as a secondary source of supply connected with the system of sprinkler-pipes, proper check-valves to be placed in the pipes. Protection by hydrants should not be overlooked, but they should be independent from the system of sprinkler-pipes."

At the present stage sprinkler protection appears to be a change in the fire contingency, attended with incidental reduction of loss. Great confidence is felt in the eventual successful establishment of the method, and thereby the mills so guarded against fire will either be kept in the specially hazardous class by small lines at specially hazardous rates, or reduced to the non-hazardous plane of brick dwelling-houses with large lines at dwelling-house rates. At the present stage, with little established that is definite, the Exchange Committee recognizes that "the conditions vary with every risk," and that each case should be considered by itself. If, however, we are to understand the first paragraph quoted as meaning what it says, the variation in risk is reduced to an inconsiderable trifle, the fire cost being almost entirely eliminated—that is, reduced to less than 2 mills per annum per $100 of insurable value.

Store-Front Decoration.

The London *Decorator and Furnisher* prints the following: The question how to deal with modern shop fronts in an artistically decorative manner is one that is daily forcing itself more and more upon the attention of architects and others. The desire for ample and imposing window space, arising from the keen competition of trade and the advertising tendencies of the present day, can now be satisfied to the utmost through the facilities offered by modern iron construction and the manufacture of plate glass. There is no structural difficulty in supplying the wants of the shopkeeper of to-day, and this is the main reason why the decorative difficulties are increased. With stone fronts the incongruities are conspicuous. We often meet with shops of 40 feet frontage having piers not more than 15 inches wide on each side of the party division line. The main wall is carried by a girder whose ends take their bearings upon cast-iron stanchions. These stanchions are masked by pilasters of stone, marble or granite, above which there is a stone entablature attached to the girder with levis bolts. The eye is offended by architectural proportions quite inconsistent with stone construction. With 15 inch piers and a clear bearing of nearly 38 feet persons unacquainted with construction must be impressed with the insecurity of a stone beam about 2 feet deep which is supposed to carry a front wall some three or four stories high, and, to make matters worse, the strong beam is necessarily jointed in lengths of 6 or 8 feet. Sometimes, also, the shop front is built in two stories, and then the slender proportions of the piers become increased in a double ratio. The stone front offends the eye, not because it is a sham, but because it does not represent any possible form of construction.

When the iron construction is cased up in wood the effect is much more satisfactory, because wood is familiar as a decorative material in a way that stone is not. Wood can also be employed for the mullions dividing the glass, so that the whole may form one composition. These mullions are often treated as columns, with caps and bases, but the projections of the members should be slight, that they may die against the frame and not present awkward breaks upon the glass line. The carved foliage upon the caps should be bold and simple, and not, as we too often see it, abounding in unmeaning clusters of natural leaves. If quadrangle spandrels are formed above, these may very appropriately be filled in with ornamental hammered metal work, behind which means of ventilation can be provided if necessary. The paneled casings at the side will admit of varieties of treatment. Ornamental tiles may be introduced into the panels, or even slabs of marble or mosaic. The enriched moldings employed in the front may be in wood or in metal. Sometimes good effects are obtained through the introduction of bronze bosses, bands and other ornaments, so that the front presents a combination of wood and metal. Many of the modern shop fronts in Paris are excellent examples of this kind. A proper decorative distinction should always be preserved between wood and metal. Dark bronze will form a suitable contrast with light oak, or polished brass and gilded metals with dark woods. Of late years ebonized wood with incised gold ornament has been much in favor, but there is room for greater varieties of treatment than we generally see. Polychromatic decorations might often be introduced with advantage.

A front should, so far as possible, be so decorated as to form a suitable frame to the goods exposed in the window, and with this object it is often advisable to leave the decorations to be completed when the trade of the occupier is known. As a general rule, however, brilliant coloring does not find favor with the shopkeepers. Probably they have discovered that it detracts from the effect of the window, which may be the reason why the gaudy brass finishings once so common are now less in request. Somber greens, browns, chocolate and black are suitable where there is no very broad surface to be covered, while moldings and enrichments may be picked out in gold, vermilion and bright blue. Flatting is not to be recommended, as it does not stand exposure to the weather, nor would we look with much favor upon those combinations of wood and plaster which are to be found in some old shop fronts. Hardwoods and metal are probably the most economical, because the most durable, materials.

Usually the frieze above is utilized as a name plate, and it is to be hoped that our tradesmen will in time discontinue those glaring letters of gigantic size which now disfigure the fronts of many houses. Perhaps if architects had not formerly ignored the necessity of names and announcements upon business premises the practice of posting them in unsuitable places would have become less prevalent. When the distinction of architrave, frieze and cornice is preserved over a shop front the architrave should be, and often is, reduced to little more than a mere molding, so that the frieze may be of sufficient width to allow space for names and announcements. The cornice frequently forms a box for a sun-blind roller, the bed-mold being the lath, which is removed from position when the blind is let down. Here opportunities for tasteful decoration are often thrown away. The iron guide-bars and their fixings, which are attached to the blind lath, are generally of a perfectly plain, and, indeed, ugly, character; and every attempt is made by painting them to match the woodwork to ignore their existence. Yet why should not this ironwork, which cannot be concealed, be made a source of gratification to the eye by means of appropriate coloring and gilding.

This is the age of iron and steel construction, and those who object to wooden shop fronts on the score that they are not fireproof, or for any other reason, ought seriously to consider how iron stanchions and girders can be appropriately decorated. We have seen riveted girders exposed to view and painted, and there seems no reason why they should not be made pleasing to the eye if the money that would otherwise be spent in casing them up were employed in providing ornamental rivet-heads and other embellishments. No diffidulty need be experienced in the treatment of wrought-iron stanchions, the front flanges of which can be cast as fluted, chamfered or paneled pilasters, and can be painted and gilded or plated with some decorative metal. If thought desirable the whole of a shop front could be treated successfully in metal and glass, the sun blind being hung upon ornamental hooks over the window, and the blind lath attached to private lamp posts at the edge of the footway, as at many West End shops in London.

New Process for Making Steel Pipe.—The Berlin *Eisenzeitung* contains an account of a new process for manufacturing steel pipe and tubing, of which it speaks in an enthusiastic manner. A syndicate has been formed to build works at Burbach, the capital being 1,200,000 marks, of which 500,000 marks are issued to the patentee, A. Mannesmanne, of Remscheidt. It is stated that Funke & Ebers, of Hager, Germany, have also purchased patent rights, and a large firm in Paris propose to apply the method to the manufacture of copper tubing. The following is the process alluded to: As soon as the steel is cast into the round mold a core is thrust down into the steel, so that a tube is formed between it and the walls of the mold. In order to prevent cracking of this annular casting during cooling, the core is so made that it follows up the shrinkage of the steel. The steel cup thus obtained may then be rolled in an ordinary train. Trials made at the Burbach works have been very successful.

Mr. Alfred T. Brainerd, chemist, of Birmingham, Ala., sends us the following analyses of native bitumen found in Alabama, locality not stated:

	Per cent.
Moisture	1.257
Volatile matter	77.754
Fixed carbon	16.817
Ash	4.172

Mr. Brainerd adds that this bitumen occurs in a liquid state and has quite a flow in several places in the same locality where it is found. The orifice from which it comes is, however, small, and it is thought that by boring the flow can be increased and a larger daily product can be obtained.

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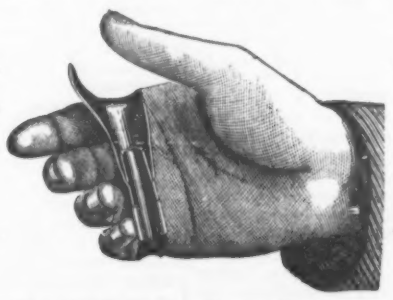

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They are nicely packed in boxes, one dozen each of 60 pounds weight, suitable for shipping by land or water to any part of the world.

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For sale by the Hardware trade generally.

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The characteristic feature of the invention is a curved blade, provided with saw-tooth cutters, and furnished with suitable working handles. It is our purpose to prosecute all infringements, and to hold responsible to the full extent of our ability and of the law all parties who manufacture any knife infringing upon the patent, or who deal in the same. Several suits have been already ordered.

All manufacturers and dealers are hereby warned of our rights, and the public are cautioned against purchasing any Hay Knives which are not of our genuine manufacture.

HIRAM HOLT & CO.

EAST WILTON, May 10, 1886.

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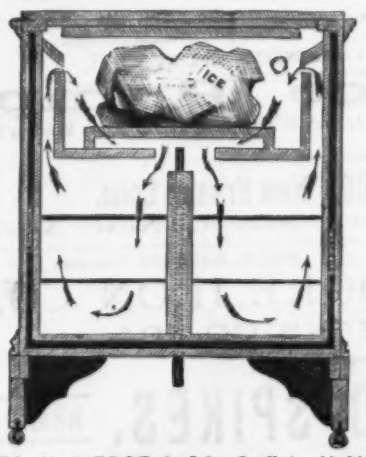

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English Letter.

(*From Our Regular Correspondent.*)

LONDON, August 9, 1886.

THE OUTLOOK

is not better than it was when I last wrote, but there are still those among us who profess their ability to detect symptoms of a coming improvement. They allege that the weeding-out process has progressed sufficiently far to bring about a near balance between demand and supply, and aver that in some lines there can be little question that bottom prices have been reached and passed. I am still among the skeptics, and confess that I am unable to perceive the "signs and wonders" thus foreshadowed. On the contrary, I hear rather more grumbling than ever, and I know that it is most difficult to collect money on current accounts. Further, I hear many very persistent rumors affecting the credit of sundry firms in England and Scotland, so that I am not disposed to be sanguine until I am able to see my way much more clearly than I can do at present. Were the evidence opposed to my views stronger than it is I should not for a moment presume to stand against the opposition. As it is, however, I find but very few of the optimists, and they are not of very high rank; consequently I must stick to my diggings and let events decide between us.

There is again some talk of renewed restriction in Scotland and the North of England, but I fancy it will come to nothing—in Scotland, at all events. In that country two of the largert producers, Messrs. Baird and William Dixon, Limited, are understood to be so desirous of allowing matters to take their natural course that they will not take any part in concerted restriction. They know that some of their competitors are carrying on business at a loss, and they are credited with the belief that it is only a question of a short time for these losers to come to a standstill, when the fittest, who have survived, will be in a position to do much better than for some years past. There may be a flaw in this reckoning, of course, but it is not unreasonable on the face of it that the strong men should decline to interpose between their weaker rivals and the fate which threatens to overtake them. Meantime some of the Scottish "bears" are stated to have covered most of their transactions, and are sending iron into the stores for the purpose of enabling them to "make deliveries." This will avoid the "evil day" for a time, but there must be a settlement sooner or later, and when it does come there will be trouble on hand in the Glasgow iron ring. The great problem is as to what is to be done with the 800,000 tons of iron in Connal's stores. It is continually being increased, yet it never goes into consumption, and the course of trade is such that there is little or no likelihood of its ever being needed for actual consumption short of its use for steel-making or some similar purpose requiring large quantities; therefore it bids fair to lie unused. On some of the warrants the banks have made advances to the extent of two-thirds of the value, but they are understood to guard against ultimate disaster by requiring a constant margin to be kept of 5/ below the current market price—that is to say, the borrower must always keep his loan at that limit. So far as it goes, that is prudent and good, yet one cannot avoid the natural inquiry as to what will ultimately come about when lenders find that they are quite unable to realize their securities. If the security is not negotiable it follows that the loan might as well be written off. The orders for rails, referred to in another paragraph, from the United States, coupled with inquiries for billets, have caused some persons here to assume that you are on the eve of another boom. That may or may not be the case. I venture no opinion. I understand, however, that the lot placed in Wales is for delivery at one of your Gulf ports, and the other is not unlikely to be a further order from the Chicago, Burlington and Quincy Railroad. Anyhow, the price—£3. 12/6—(equal, say, to about $33 or $34 c.i.f. your ports) is not unattractive, especially as the deliveries will doubtless be more promptly made than could be done by your mills in their present congested condition. As I write an early copy of the Board of Trade returns for July reaches me. I have not time to extract full details, but present the following chief items: Total imports, £29,452.497, against £31,597,616 in July, 1885; imports of metals, £1,221,768, against £1,472,452. Total exports, £18,480,374, against £19,173,846. Exports of metals, £2,789,582, compared with £2,796,802: exports of machinery and millwork, £913,-952, against £981,423. Total exports of iron and steel, 321,242 tons; value, £1,894,384, against 271,691 tons and £1,880,961 in July, 1885. To the United States, 38,700 tons pig iron, against 6973 tons; railroad iron, 6162 tons, compared with none at all; hoops, sheets, &c., 3998 tons, against 2021 tons; cast or wrought iron, 259 tons, compared with 138 tons; old iron, 3550 tons, against 2158 tons; hardware and cutlery, £26,409, against £31,397; steam engines, £2914, against £4281; other machinery and millwork, £39,344, against £26,098, and tin plates, 18,915 tons, compared with 21,616 tons in July, 1885.

THE IRON MARKET

nominally remains precisely as it was last week, but the fact cannot be disguised that the situation is becoming more serious. Rumors are now afloat as to financial difficulties in certain quarters, and some strong views are being expressed as to the conduct of the banks in backing up concerns which, if left to themselves, would soon find their level. It is understood, however, in the North that proposals for concerted action are about to be revived; and upon the strength of the proposition an attempt has been made to invest the Glasgow warrant market with a firmer tone. Transactions, however, have been small; the closing price was 39/1½ ₹ ton. The continued large quantities put into store in Scotland are believed to be making their influence felt upon the export market, and uncomplimentary hints are being thrown out, which, if openly discussed, would, it is feared, reveal a condition best described as highly unsatisfactory. At Middlesboro' the notable feature of the week has been the issue of the monthly returns for the Cleveland district. On the West Coast no change has transpired, and late rates rule. From Staffordshire unbroken dullness is reported, with business doing in exceedingly small lots. The Swedish market has shown no signs of advance. The Indian inquiries are still few, and business is interfered with by the low rate of exchange. In the Levant a trifle stiffer tone has been observed, but from Sheffield and from the United States transactions are few and far between. The finished departments are as dull as possible, while specifications of importance are very scarce. Some bridgework is about to be given out for India, but the total amount is not large. In old scrap business is fairly good at recent prices. Steel is on the whole affording fair employment, but nothing fresh has yet been done to give to the steel-sleeper trade the impetus it requires. The armor plates for H. M. S. Nile and Trafalgar have not yet been placed, but are daily expected to be given out. These orders are the largest that have been placed for several years past, and will keep the works employed for many months ahead. The inquiries are for about 4900 tons of plates, exclusive of bolts, &c. Inquiries have been made during the week for billets for the United States, but at the time of writing it is not known whether business has resulted. Steel rails are quiet, makers contenting themselves with contracts at present in hand, under the impression that prices will presently lift. Although £3. 5/ is now quoted there are no instances known to the market of orders being placed at that figure. It is reported that contracts for 20,000 tons in two lots of 10,000 each have been placed on the West Coast and in Wales respectively for early delivery in the United States. Nothing definite is known at the time being but it is believed that the price cannot be more than £3. 12/6, f.o.b. at the nearest ports.

SCOTCH PIG IRON

is just a shade better on the week in the open market, probably owing to the shadow of coming troubles with the bears, who are still in some doubt as to getting out "clear." There are now 85 furnaces at work in Scotland (66 on ordinary pig), as compared with 93 a year ago. In Connal's stores there are 799,783 tons of pig iron, compared with 612,-673 tons this date 1885. Shipments to date are 38,915 tons behindhand, while the imports of Middlesboro' pig into Scotland are 27,587 tons in arrears. Current prices are:

Deliverable alongside.	No. 1.	No. 3.
Gartsherrie, at Glasgow	42/6	40/6
Coltness, "	40/3	42/
Langloan, "	42/6	40/9
Summerlee, "	44/9	40/9
Carnbroe, "	40/6	38/6
Chapelhall, "	44/	....
Monkland, "	39/3	35/6
Clyde, "	41/9	38/9
Calder, at Port-Dundas	45/3	40/3
Govan, at Broomielaw	39/9	35/9
Glengarnock, at Ardrossan	41/6	38/6
Eglinton, "	39/	35/9
Dalmellington, "	40/	37/3
Shotts, at Leith	43/6	43/
Kinneil, at Bo'ness	42/6	41/6
Carron (best selected), at Grangemouth	47/	....

MIDDLESBORO' PIG IRON

is very dull at rather below late rates, owing to the great increase of stocks last month. Quotations for G. M. B., f.o.b. at makers' wharves in the Tees, net cash, are:

No. 1 Foundry	32/	Mottled	27/9
" 2 "	31/	White	27/3
" 3 "	29/3	Refined metal	45/9
" 4 "	28/9	Kentledge	33/6
" 4 Forge	28/3	Cinder	27/6

The official returns of the Cleveland Ironmasters' Association for July show that the make was 206,176 tons, 4000 tons more than in June; the stocks were 706,736 tons, an increase of more than 17,000 tons, and the shipments 60,831 tons, a decrease of 3000.

HEMATITE PIG IRON

is a little steadier at 41/ @ 42/ ₹ ton for mixed-lots, while West Coast named brands are as follows:

	No. 1	No. 2.	No. 3.
Cleator	42/3	42/	—
Lonsdale	42/	41/9	41/6
Workington	42/	41/9	41/6
West Cumberland	42/	41/9	41/6
Lowther	42/	41/9	41/6
Distington	42/	41/9	41/6
Solway	42/	41/9	41/6
Maryport	42/	41/9	41/6
Harrington	43/9	42/3	41/9

The shipments of these pigs from West Cumberland have increased 55,382 tons this year. Stocks are 112,004 tons, or 12,837 tons additional since January 1 last.

BLAST-FURNACE RETURNS.

The gradual decrease in the number of operative blast furnaces in Great Britain is shown by the following summary of the monthly returns of the London *Ironmonger*, August 7:

Total number of furnaces	
Existing July 31, 1886	671
In blast July 31, 1886	391
Out of blast July 31, 1886	460
In course of erection July 31, 1886	8
On ordinary pig iron of various districts	294
On hematite pigs (about)	88
On spiegeleisen	11
On basic (about)	8

TIN PLATES.

There is a quieter tone in the London market, makers evidently wanting orders here and there, and showing a little more disposition to meet the views of the buyers. The latter, however, are still holding off as much as possible with a view to obtain more decided concessions than have as yet been offered. Some of the leading works are still reported as well off with orders, and in the aggregate a fair business has been booked by some makers. We quote good ordinary IC cokes 13/3, f.o.b. Liverpool. At Liverpool this has been to some extent a broken week; and now since business has been resumed there is not much movement in the market. There are certainly a few inquiries for ordinary sizes Bessemer-steel cokes to hand for prompt shipment, and these are being negotiated for, sellers being firm so far at 13/6 IC. There are some few other inquiries for Bessemer steels in special sizes, such as 14 x 19¼ and 19½, as well as 10 x 20's and only the same basis prices are now asked for these. The demand for coke tins for the United States is unusually light this week, but there is a somewhat better demand for the Continent and colonies. Orders for both these markets continue pretty numerous, and the price as a rule

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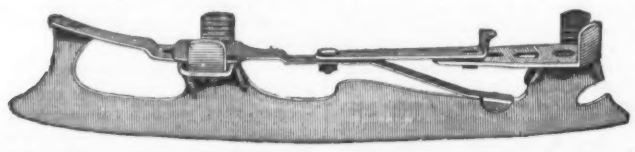

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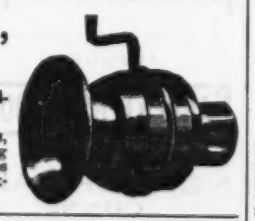

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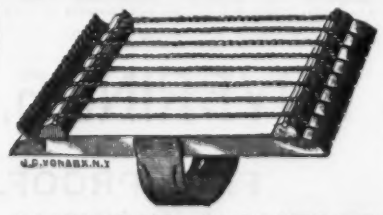

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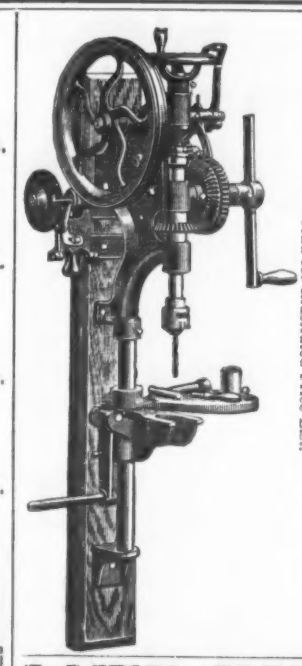

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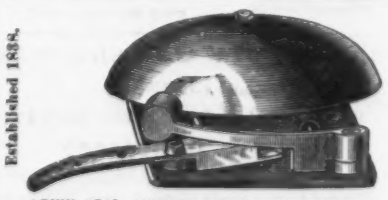

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is the same as for steels, viz., 13/6 IC, which is freely obtained. There is not much demand either for Siemens steel plates with coke finish. The inquiries have been few and only for small quantities. There is no change in the prices of these. In charcoal tin plates there is very little doing, and prices are unchanged. Ternes have been asked for a little oftener of late, and prices are maintained at the old figures, ranging from 12/6 to 14/ IC. Coke tin plates and steel wasters continue in fair demand at from 12/3 to 12/9. Shipments, though not quite so heavy last month as the previous month, yet make up a good average total. Most works are full of orders and many are behindhand with deliveries.

THE HARDWARE TRADES.

In London retailers remain quiet in most departments, and manufacturers' agents experience considerable difficulty both in securing orders and getting in outstanding accounts. There is a little more spirit about some of the colonial markets, but not sufficient to materially alter the complexion of affairs. At Birmingham a lull has succeeded to the activity of the week preceding bank holiday, and trade has hardly resumed its old channels yet. Merchants report favorably of the orders arriving, more particularly from the United States and New Zealand. The recovery of the home trade, which was proceeding satisfactorily up to close of last week, has apparently been checked by the holidays. The seaside towns are now in the hight of their season, and if the weather remains favorable good repeat orders may be shortly expected. The August shooting is naturally interfered with by the resumption of Parliament, and gunmakers see no chance of compensation at home for the slackness of the American demand this summer. At Sheffield the export department continues to be a most satisfactory feature of local trade, home orders showing a tendency to shrink rather than to expand. Local manufacturers of agricultural requirements have, however, derived some advantage from the presence of the Yorkshire Agricultural Show, which has had immense patronage from Sheffield and the surrounding towns. The steel and file houses are much relieved by the enlarged demand from Canada, the United States, and in a lesser degree from the southern colonies. The Continental trade is also finding good employment for a limited number of firms, and the Spanish buyers are already placing orders in view of the new tariff arrangements coming into operation. Altogether, despite the quietude of the Indian market and the depression in South Africa, the state of the foreign and colonial trade is more encouraging than it has been for some time.

The Great Eastern.

(Concluded from page 9, August 19.)

All this time the work of heaving up the anchor was proceeding. The anchors and chains of the Great Eastern are the largest ever made. That to be raised now weighed no less than 11¼ tons; the cable, of which there were 35 fathoms—or 210 feet—out, is the most colossal chain ever made. The iron composing the links is 3¼ inches in diameter; each link weighs 70 pounds, and there are five links to the fathom, so the weight of the chain is 350 pounds per fathom. Thus there were outside the ship no less than 53¼ tons of cable and 11¼ tons of anchor, or 17 tons in all. The cable was led to a powerful steam capstan on the lower deck. The capstan is driven by a curious old-fashioned engine, with two inclined oscillating cylinders, pointing down to the crank, instead, of up. Steam is supplied by a locomotive boiler, with the safety-valve loaded to 40 pounds. The original funnel of this boiler seems to have disappeared, and that rigged in its place did not perform very well. The coal used was Welsh steam coal, requiring a sharp blast, and this was not to be had, and Mr. Freeston, who was in charge of the capstan, could not get the boiler to keep steam. With 40 pounds it was all the capstan could do to get the cable in, for there was now a very heavy strain on it, due to the set of the tide, so the process of weighing consisted in getting up steam, winding up as much cable as could be got before steam went down and the capstan stopped, and then waiting till steam was got up again. It will give some idea of the enormous mass of the cable when we say that 20 men with double purchase blocks were needed to fleet it along the deck from the capstan to the chain hatch, through which it passed to the locker below.

Everything is possible to those who can wait, and at 5 p. m. on Thursday the anchor left the ground; the engines turned ahead; Mr. John, the Milford pilot, took his place on the bridge, and the Great Eastern started on her voyage. Mr. John had a very onerous and responsible task. Concerning the way in which the ship would steer, he, of course, knew nothing. Every one on board was satisfied that the tug could do little to avert a catastrophe if the ship refused to answer her helm. The weather was, however, propitious, and the Great Eastern forged slowly ahead, her engines making about 18 revolutions per minute, while the fires were being carefully brought on. The danger was that if her fires were urged too quickly the boilers would start priming, which would bring the engines to a stand at once. Mr. Jackson, who had not slept for an hour for three days and three nights, seeing the ship under way, contemplated retiring to get a little repose. Mr. Beckwith took charge in the engine-room, watching for priming as a cat does for a mouse, while Mr. Jackson himself looked after the boilers. It was clear that the engines were very ticklish. The vacuum varied in all the four condensers. It was best in the two after cylinders, averaging about 22 inches, and worst in the forward starboard engine, which was, as we have explained, short of condensing water at first. In this condenser it stood at 17 inches. The pressure was very low in the engine-room, because it was necessary to open the stop-valves on the boilers with the utmost caution and by degrees to avoid priming. The greatest care was necessary to admit just the right quantity of injection water. Too much or too little injured the vacuum at once. All was going well, however, and the vacuum was creeping up slowly, but steadily, when a very curious event occurred in the engine-room, which brought the voyage of the Great Eastern to a close that day. Sensational paragraphs have appeared to the effect that a steam-pipe was burst on board the ship. Nothing of the kind took place.

About 6 p. m. three holes were knocked in the pipe by some cause which we cannot pretend to explain. Two of these were very small, about 1 inch x ¼ inch; the other was a rent about 3 inches long x ½ inch wide at the widest part. The pipe was not split or ripped, and the holes, which were several inches apart, did not communicate in any way with each other. The metal was punched out from the inside as though it had been driven out by a bullet. It was at first assumed that the metal was pitted and corroded, and had failed because it was weak, but there was no evidence that any serious corrosion had taken place inside the metal, although it was somewhat thinned by the action of the drip of a cock above. On the contrary, the iron appeared to be of nearly full thickness and of excellent quality. It was quite bright in the fracture, and hard hammering was required to drive the ragged edges back in order that a plate might be put on. The fracture was not caused by overpressure, for there were not more than a couple of pounds of pressure in the pipe at the time. Mr. Beckwith was standing close by, but neither he nor any one else received the slightest injury. Mr. Jackson, who was in the engine-room at the time, ran up and attempted to stop the leak with a swab of waste and a timber shore, but at the same moment the engines stopped, and the pressure at once ran up in the pipe, so that the swab was blown away. There is only one feasible explanation, namely, that the boilers had primed again, and that a mass of water was driven forcibly against the pipe, and had acted like a hammer. This view is quite consistent with a well-known theory of boiler explosions, originating many years ago with Mr. D. K. Clark and Mr. Colburn. The stop-valves on the boilers were screwed down, and Mr. Jackson and Mr. Beckwith at once proceeded to put repairs in hand. In the engine-room staff was a boiler maker. On board the Great Eastern is a large blacksmith's shop, with a punching and shearing machine, while close by it, we may say parenthetically, is a fine large Whitworth lathe—in fact the Great Eastern carries a large plant for repairs. A piece of ⅜-inch boiler-plate was quickly cut to shape, bent in the forge, and by 11 o'clock it was screwed on with a ⅜-inch screw bolts, a sheet of india-rubber being interposed. When the engines stopped, Mr. John, with the aid of the tug and the tide, skillfully brought her into a safe position off Great Castle head in the haven and there dropped anchor.

The tedious process of weighing began early on Friday morning and the ship started once more on her voyage at 7 a. m. The weather left nothing to be desired, and the sea was quite calm. The tide set hard against the great ship and she made slow progress. Mr. Strong in his tug accompanied the ship as far as the Bishop's Rock Lighthouse, a point not reached until about 11 a. m.

The boilers from time to time gave trouble from priming, but they were doing better each hour. The scum-cocks were kept constantly open. Things improved each hour in the engine-room, and the engines gradually worked up to 22 revolutions per minute, and no longer creaked or groaned; there were no hot bearings. The vacuum rose to 25 inches and 26 inches in all the condensers save the forward starboard one, in which it remained at about 22. The steam pressure got up in the engine-room to about 12 pounds, while it was about 17 pounds in the boilers, but it was necessary to keep the stop-valves a little closed on accout of priming. The tide was so strong off Bishop's Rock that the ship made little or no progress. At last it turned and the Great Eastern began to move. Mr. Strong now left her with a parting cheer, and the great ship was left to her own resources. Every moment the engines performed better and at last worked up to 27 revolutions per minute, the ship going about 5½ knots. As the screw was going over 12 knots it will be seen that the ship was tremendous, a fact which bore unmistakable testimony to the foul condition of the hull. The day passed uneventfully. About 10 p. m. a foolish alarm of fire was raised; a fireman rushed down to the saloon in search of Mr. Beckwith, shouting at the top of his voice that "the stokehole was on fire." A moment's thought sufficed to show that this was a very unlikely place for a fire to occur. When we reached the deck we found that Mr. Reeves, the chief officer, had got the hose passed along to the midships starboard stokehole, but it was not required. The boilers are lagged with felt and wood, and a small piece of this had slipped down into contact with the upper edge of one of the smoke box doors and began to smolder; it was pulled down in a minute and the affair was over. This is the origin of the sensational statement which has gone round the daily press to the effect that a fire broke out on board the ship. There was no fire, and not a bucket of water was needed.

All Friday night the ship kept on her way and in the forenoon she passed the Great Orme's Head. In the afternoon she arrived close to the bar lightship and dropped anchor, as the tide would not serve until late; and Mr. Edwards, the Liverpool pilot, did not think it prudent to take her in in the dark. The great ship attracted no small attention from the numerous steamers passing and repassing, some of which came out of their way to have a look at her. On Sunday morning the anchor was once more got up with much difficulty and delay, and the Great Eastern proceeded to cross the bar and run up the river. It was blowing hard dead in her teeth. Three tugs came out to assist her—the Toiler, Ranger and Brilliant Star. Two of these took her in tow while the other stood by. At 9 35 the bar lightship was passed to starboard. Shortly afterward, as the wind freshened, Mr. Edwards availed himself of the services of the third tug. The beach at New Brighton was crowded with spectators, and the same thing may be said indeed of the shores of the river the whole

way up, while the ferry steamers were packed as full as they could hold. The ship was dressed in bunting from end to end; a flag bearing the word "Lewis" floating from the mainmast head. The Victoria Tower was passed at 12.20, Seacombe at 12 45, and at 2 p. m. the anchor was dropped in the Sloyne in a berth selected by Mr. Gray, who was present with a tug and anchor barge to get her moored. The tide was running out very strongly when the anchor was let go, and first 35 fathoms of cable were given her. As she had a little too much way on her the engines were turned astern slow. They handled readily enough now. Then the captain rung to the engine-room "stop," and those on board crowded to the bows to watch how the anchor would take the strain. The 35 fathoms were not long running out; then 35 more were given to her and the big ship slowly went astern. Then down came the compressors and the cable rose from the water and stood out rigid as a bar for some 40 fathoms of its length. The strain was enormous, but everything held. Anything less gigantic than the 3¼-inch cable would have parted. At this juncture Mr. Collier, the second officer, came forward to ask the captain if he still wanted the engines to go astern. It then appeared that from some accident to the engine room telegraph it stood at "slow astern" in the engine room. No wonder there was an enormous strain on the ground tackle. The engines were, of course, stopped at once, and then a good length of the cable sunk out of sight. The episode supplies a capital illustration of the enormous size of the ship. No one forward had the least idea of what was going on aft, and communication had to be maintained between to bridge amidship and forward and aft by a number of men stationed to pass the word along.

So ended the trip of the great ship—a trip in a sense very adventurous. It was perhaps the first time in the history of marine engineering that a ship was taken to sea the engines of which had stood idle for 12 years. It may be asked, Why were they not overhauled before the ship started? The answer is that there is no place in Milford to overhaul them, and that one of the objects with which the ship made her voyage to Liverpool is to have them put in a state of thorough repair for the voyage to Gibraltar. She had to use the engines as they were or remain in Milford. At one time it was contemplated to move her with tugs, but the difficulties and dangers of such a course were too serious to be encountered. The greatest possible credit is, we think, due to all concerned for the safe conduct of the voyage. In Captain Comyn the ship had a commander competent in every respect to the performance of his duties. Mr Jackson did everything that one man could do. As we have said, for three days and three nights he never laid down. He fought with difficulties which would have fairly discouraged a less energetic and determined man. To Mr. Beck with no small praise is due for leaving an important business to take care of itself for some days, and not only coming himself, but bringing his principal foreman, who did good service, with him. No doubt love for the old ship in which he has spent so much of his life—he was chief engineer of her since 1864—operated powerfully. Mr. Reeves, the chief officer, and Mr. Collier, the second officer, worked as hard as men could work, not only from morning till night, but all night as well; and Mr. Freeston did what man could do with the steam capstan.

A word of special praise is due to both the pilots. Mr. John had the easiest work in getting the ship out of Milford and round to the Bishop Rock, when his jurisdiction ended; but then he knew nothing about her steaming qualities, and had a very serious responsibility on his shoulders. Mr. Edwards, the Liverpool pilot, had the far more difficult task of taking the ship up the river, which he accomplished with consummate skill in the teeth of a gale, but he had at least learned that the ship really would and did steer admirably.

Foreign Markets.

FRANCE.

PARIS, August 11, 1886.—*Metals.*—Nothing has occurred to revive the demand; the dull season will only terminate with the present month. Meanwhile prices have remained sustained, Lead even being better. We close as follows: *Copper.*—Chili Bars, 101 25 @ 105 francs ℔ 100 kg.: Ingots and Slabs, 106.75: Best Selected, 108.75, and Pure Corocoro Ore, 108.75. *Tin.*—Banca, 270; Billiton, 237.50; Straits, 260; Australian, 251.25 and English, 260. *Lead*, 32.50 @ 33.25, and *Spelter*, 36.75 @ 37.25. *Iron.*—The Iron markets in France have developed a little less animation during the week, but this by no means diminishes the undercurrent of strength and confidence. The readiness with which money has been appropiated for great public undertakings, both by the National Legislature and the Municipality of Paris, and the considerable amounts to be thus spent, prove that our rulers are determined to do all they can to give work to the people, and fortunately France and Paris are rich enough to indulge in this kind of policy. But for this we might have sunk into the slough of despondency which marks the Iron trade beyond the Rhine just now, which certainly benefits but a few. The market here is steady at 14 @ 15 francs, Merchant. The North has a steady, moderate run of orders. The works getting on most smoothly there just now are the Nail and Bolt works, as well as Hollow-ware factories. This is precisely the case, too, in the Ardennes, but activity there extends even to many more branches. The Haute-Marne also reports very favorably. The center is the only part of France reporting downright dullness.—*Moniteur des Intérêts Matériels.*

BELGIUM.

BRUSSELS, August 11, 1886.—*Iron.*—The Iron market has displayed great firmness; prices of Finished Iron as established by the syndicate are obtained without difficulty. Holland in particular has given liberal orders without trying to obtain concessions. On taking a general view of the Belgian Iron market it must be confessed that the present situation is satisfactory enough. All the details of the syndicate agreement have not yet been fixed, however; for example, the check to be put on production, negotiations about which have made but slow progress for a month past. Furthermore, the compensation that is to accrue to certain works—Charleroi, for example—has certain vantages over Liège—like, for instance, the Paris market being handier. All this once settled and the syndicate will continue doing good service, and the harmonious feeling existing among Belgian makers removes all difficulties in the way of equitable arrangement. The knowledge of this being the case is one of the causes of the firmness noticeable. Meanwhile we quote Charleroi Foundry Pig, 5.75; Luxembourg, 3.90, Athus Forge Pig, 3.80; Charleroi do., 3.70 @ 4.70; Merchant Iron, 10; Angles, 11.50 @ 12.25; Sheets No. 2, 12.50; No. 3, 14.50, Commercial, 16.50; Thin, 18.50; No. 4, 20.50; Steel Sheets, 15.50. *Coke and Coal* are steady; next month the domestic Coal demand will gradually set in, and greater animation will rule thenceforward.—*Moniteur Industriel.*

GERMANY.

HAMBURG, August 11, 1886.—*Iron.*—We receive the following from our Dortmund correspondent: In the Iron-Ore trade matters have got to be worse. Foreign underselling Domestic causing a general decline. Prices of Pig Iron are drooping, there being less demand for it; production is steadily in excess of requirements. There being hardly any inquiry for export, Spiegel is lower. Forge Pig is neglected; has further declined, and leaves a loss to makers. The competition of Luxembourg is disastrous. Foundry Pig has failed to meet with a better demand; foundries are hard-up for work. Even Bessemer and Thomas begin to feel the widespread stagnation; their sale is dragging. Steel works being in a critical position, forcing them to curtail their output. As for Finished Iron it cannot be denied that domestic statistics are reassuring enough, but in spite of this prices continue tending downward; the reason has to be searched for in competition, but few rolling mills being satisfactorily engaged. Thick Sheets are irregular; some mills are busy, others are not. In Thin Sheets the situation is downright deplorable. The attempt to form a syndicate at Siegen has failed. Wire Rods are also precariously situated for the lack of an export demand. Nothing that is encouraging has occurred in railroad material, except a few orders for Cars, for which the scramble is such that the adjudication will establish a further decline. *Metals* are moderately active and unaltered.—*Borsenhalle.*

HOLLAND.

ROTTERDAM, August 9, 1886.—*Tin*—Statistics for July:

	End June 1886. Slabs.	End July 1886. Slabs.	End July 1885. Slabs.
Banca stock on warrants.	20,182	34,448	49,997
Billiton stock here and at Amsterdam	16,770	22,020	31,916
Total	36,952	56,468	81,913
July deliveries of Banca	11 500	8,982	19,709
July deliveries of Billiton	6,973	4,550	18,979
Total	18,474	13,532	38,688
Deliveries of Banca since January 1	70 530	79,502	76,150
Deliveries of Billiton since January 1	45,422	49,972	71,347
Banca ready for coming auctions	14,400	14,400	1,800
Banca afloat	81,339	62,091	102,701
Billiton afloat	34,107	22,907	18,706
Price of Banca in guilders	62½ fr.	60 fr.	56 fr.
Price of Billiton in guilders	62 fr.	59½ fr.	56 fr.

The Government returns for the month of May are as follows:

Export of Tin from Holland.

	May. 1886.	May. 1885.	May. 1884.
To Germany.....Tons	491	373	282
England	29	11	320
Belgium	80	68	65
France	41	34	12
Hamburg	37	43	49
The United States	30	37	5
Other countries	55	37	68
Total	769	603	801
	Five months. 1886.	1885.	1884.
To Germany.....Tons	2,431	2,031	2,077
England	112	94	376
Belgium	400	293	397
France	152	160	82
Hamburg	216	145	204
The United States	244	205	165
Other countries	205	152	235
Total	3,760	3,080	3,536

Since above statistics for July were published there has been a moderate business doing, Banca being obtainable at 59.75; Billiton, October, at 59.12½; August, 58¾; November, 58.75 @ 58.87½.—*Koch & Vlierboom.*

SPAIN.

BILBAO, August 8, 1886.—*Iron.*—The Iron-Ore market during the week has been inanimate. Freights remain depressed. Shipments so far, 1,945,922 tons of Ore, against same time last year, 1,999,626.—*Revista Minera.*

AUSTRIA.

VIENNA, August 8, 1886.—*Iron.*—The Iron trade, without being brisk, has been satisfactory during the week; the large orders for Locomotives and Cars received from a dozen railroad companies, as well as those for Petroleum and other Tanks contribute to spread a confident feeling as regards the future. Iron prices are quite firm in spite of continued irregularity in the quotations of Pig in Bohemia, where the joining of the syndicate still meets with obstacles. We quote at the close in florins ℔ ton: Pig, 40 @ 49; Merchant, 95 @ 122.50; Sheets, 145 @ 147, and Beams, 105 @ 110. *Metals* have been steady. We quote in florins, ℔ 100 kg: Copper, 54 @ 56; Lead, 18; Spelter, 18.25; Tin, 131 @ 132; Antimony, 37.50, and Quicksilver, 225. *Petroleum.*—The eventual fate of the Petroleum duty is as yet an unsolved problem. Hungary seems determined not to submit to a duty of 2 florins ℔ 100 kg. on Raw Oil; it would rather be in favor of letting the same enter duty free, and charging 8 florins duty on Refined. Stimulated by the success of Fiume, Trieste is entering largely into the Caucasian Petroleum trade. There are to be built at Trieste six Iron Reservoirs, to hold together 10,000 tons, equal to six ships' cargoes, and it is estimated that Trieste will sell annually 100,000 tons. Tank cars will take it from there to Austria and Southern Germany.—*Austrian Trade Journal.*

CHILI.

VALPARAISO, June 25, 1886.—*Copper.*—In the uncertainty about the future course of the exchange market, and not willing to sell Copper till they had secured Coal, smelters withdrew temporarily from the market, but with better cable quotations on the 22d instant, and the advance of Copper to $17.30 ℔ quintal, they sold 9927 quintals. Since then the London market is down again to £40. 10/, Chili Bar futures; $17.30 equals £39. 19/. *Nitrate.*—Sales did not exceed 179,000 quintals at $3.25, 95 %, equal to 8/7½d ℔ cwt. in England. Exporters did not feel disposed to operate largely in view of unfavorable cable news, and makers were indifferent, having sold beforehand most of their product for a couple of months to come. Charters have been made for 9100 tons to Europe and 950 to the United States. *Coal*—continues stiff and tending upward. We quote Newcastle, West Hartley, 25/ @ 27/6; Australian, 18/6 and smelting, $8. *Exchange* receded to 23½d.—*Weber & Co.*

EAST INDIES.

PENANG, June 26, 1886.—*Tin.*—The market opened a fortnight ago at $35.45, and advanced to $36.75, in order to decline toward the close to $34.90. Receipts reached 10,000 piculs, Europeans taking 7700 and Chinese 800.—*Schmidt, Kustermann & Co.*

Mr. J. J. Kunstädter, of New York, well known as the inventor of a steering screw for vessels, described in our columns last year, has just secured a patent for applying the arrangement to twin-screw ships. The steering-screw is in that case worked by a central shaft located in line with the longitudinal axis of the vessel, rotary motion being imparted to the shaft by a friction or bevel wheel gearing with bevel-wheel on the propelling screw-shafts.

The stationary engine of the rolling mill at the Reading Iron Works, Reading, Pa., has just been taken out after working steadily for close upon 50 years. This engine was built in Pittsburgh, and was hauled by wagon the greater part of the distance thence to Reading. It is still in good order, and is now removed to make way for a larger engine.

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English Exports of Iron and Steel.

The returns of the English Board of Trade have just been received, covering the statistics for the first seven months of the current year. They should be studied in a different light by Americans than they are usually presented. It is interesting enough to know just how much has been shipped to us, but it generally represents business done long since, while the attention of the moment is riveted on current transactions. The latter are followed closely in weekly market reports, and statistical returns can teach us little that has not been thoroughly discounted before the figures reach us from the other side. One factor which played a part late last year seems to be absent now, and that is speculative purchases on American account in England as a hedge against any rise of raw materials here. Such purchases may not become known here, since the stock is carried abroad by the American purchaser, it being much cheaper to do so through the saving of interest on duties and freights.

To American iron and steel makers, however, the English Board of Trade returns are significant as revealing the condition of business the world over. At this time that is one of the most engrossing questions. If greatly increased shipments of iron and steel in all its forms were going to all quarters of the globe they could be certain that a larger demand from us would cause an advance, allowing higher prices here to compensate partly at least for surrendering temporarily a part of our home market. If that were the case American makers could press for the rise which conditions at home seem to warrant at no distant date. We have pointed out in a general way that the state of affairs in Europe is as critical as it was with us a year ago. In certain lines for the territory west of the Allegheny Mountains accessible by navigation one factor comes into play which is favorable to the producers of that section as against their foreign competitors. With the closing of navigation higher freights from the seaboard would make fresh importations cost more delivered. This may be held to account for the rush during the present and previous months. Should the stocks of foreign raw material, like billets, rods, blooms, &c., thus accumulated by Western works prove inadequate to cover the winter's requirements, then a moderate advance would be possible which might be hastened by agreement among the makers. Still the most important fact lies in the position abroad, and the returns of the British Board of Trade pretty clearly reflect its condition:

British Exports of Iron and Steel—Seven Months.

	1885.	1886.	Increase +. Decrease —.
Pig iron	529,094	584,248	+ 10.4 %
Bar, angle, bolt and rod iron	149,920	135,285	— 9.7 %
Railroad iron	425,673	431,616	+ 1.4 %
Iron and steel wire	30,180	24,317	— 19.4 %
Hoops, sheets, plates	182,619	171,750	— 5.9 %
Cast and wrought iron	203,234	204,450	+ 0.5 %
Old iron	40,947	86,252	+110.4 %
Steel, unwrought	30,736	59,426	+ 93.3 %
Tin plates and sheets	182,240	207,872	+ 14.0 %
Steel rails	302,391	280,842	— 7.1 %

It will be noted that when there has been a heavy increase in our purchases the English totals assume a far more favorable aspect, or, in other words, whatever improvement there has been has come through the United States, as the following table, giving the exports to all other countries, will show:

British Exports to All Other Countries.

	1885.	1886.	Increase +. Decrease —.
Pig iron	466,483	390,894	— 16.2 %
Bar, angle, bolt	148,609	133,173	— 10.4 %
Railroad iron	420,629	411,686	— 2.1 %
Hoops, sheets, &c.	172,075	160,250	— 6.9 %
Old iron	34,390	54,885	+ 59.6 %
Steel, unwrought	23,698	31,327	+ 32.2 %
Tin plates	44,763	40,569	— 9.4 %
Steel rails	297,548	261,543	— 12.1 %

With the exception of old iron and of unwrought steel the volume of business done by England during seven months of the current year with all countries of the world except the United States has fallen off considerably, a fact which is all the more significant since the year 1885 itself contrasted very unfavorably with its predecessors. English iron-makers are thus forced to face a trade still shrinking, and have not, therefore, reached the point where a gradually growing demand makes the blowing in of furnaces and the lighting of fires in idle rolling mills necessary. The burden of the discussion in trade circles there remains restrictive. Looking back at the history of the past few years, American iron-makers will thoroughly appreciate the hardships of a position they have known only too well. They will understand how eagerly the opportunity to unload upon us will be seized, and will shape their course accordingly.

We have no access to figures which might serve as the basis of a comparison of German trade with us and with other countries. The destination of a good deal of the material Germany exports is lost sight of, because the official statistics do not and cannot follow the goods sent in transit to Hamburg and to Holland and Belgium. Recent issues of German journals contain somewhat vigorous, semi-official protests against alleged misrepresentations concerning the status of the German iron works. It is asserted that the failure of the Remy Works was much exaggerated, it being small only, and by no means indicative of the condition of German works generally, because its owner had followed a cut-throat policy for years. While it is candidly acknowledged that some concerns are running at a loss, it is asserted that the great majority of them are still working at a fair profit. We are inclined to look at these utterances as mere whistling to keep up courage, because they are singularly at variance with the wails, probably exaggerated, which are addressed to the Government whenever the latter gets low bids from the makers in other countries.

As the outgrowth of a controversy in the columns of the Sheffield *Telegraph*, quite an elaborate series of tests was made to ascertain which was the superior article—the hand-cut or the machine-cut file. The partisans of the two chose a third gentleman, to whom were turned over 24 files, of which 12 were provided and one side cut by each of the contestants, after which the second side was cut by the other. The files thus completed were then sent to eight leading firms, users of files, without informing them as to the nature of the contest involved, though, of course, they bore marks for identification. The reports of these concerns went to the umpire, who opened them in the presence of the two parties. They were tried on a number of different materials, and a system of marking was adopted to give numerical expression to the differences found, 0 denoting equality, 1 representing better, and 2 much better. While crude, this system might be relied upon to bring out clearly great differences. This it did not do, and the burden of the reports of the eight firms who tested them is that there was little difference, some of them giving the preference to the hand-cut and others to the machine-cut files. On the whole, however, the advantage seemed to rest with the latter. Mr. Richard Hoskin, consulting engineer, who was the one who distributed the files and received the reports, summarizes the result as follows:

	Machine-cut.	Hand-cut.	Equal.
Bastards	4	2	2
Second cuts	4	3	2
Smooths	2	4	1
Total	10	8	5

A second test was conducted personally by the champions of the two kinds of files, the filings being weighed after every 50 strokes by a third party. After 500 strokes the result was as follows in three trials, aggregating 1500 strokes, the weight of filings being given in grammes:

	Machine cut.	Hand-cut.
Wrought iron	42 7998	31.1595
Cast steel	41 1875	28.7810
Cast iron	48.2857	44.2731

The partisan of the hand-cut file declined to accept this test, on the ground that the "superior skill and ability in filing" of his adversary would give him no chance with him of "nipping off soft material with any file, however good." The verdict of the tests to those who are not embarrassed by preconceived notions would be that the mechanical file has a slight advantage, and that between the two systems as such, other points affecting quality being equal, the relative price will determine the choice of buyers.

Street-Car Propulsion.

With the increasing attention given to power transmission during the past few years street-car propulsion has not escaped notice, and there is abundant evidence that, in a few instances at least, the subject has been carefully studied. One of the more recent additions to the literature of the subject is in the shape of a paper by Mr. A. W. Wright, published a short time ago in the "Proceedings" of the Association of Engineering Societies. The figures which Mr. Wright gives are the results of extended experiments made on the lines of the North Chicago City Railway Company, and are of special interest, as the amount of power required to start a street car and to maintain it in motion under average conditions has hitherto been practically an unknown quantity.

The power measurements were made with a Fairbanks dynamometer. With an old, worn-out rail and under ordinary working conditions 88 tests were made, with an average of 14.8 passengers, estimated to weigh each 140 pounds, and thus making a total weight, with the car, of 6772 pounds. The power required to keep the car in motion at an average speed of 5 miles per hour, including stops, averaged 109 5 pounds, or, per ton, 32.3 pounds. With a new steel rail and an average of 20.9 passengers, 53 tests gave 59.8 pounds as the power necessary to keep the car in motion, or an average of 15.6 pounds per ton. The car made 17 starts on this track with an average of 18.7 passengers. The average power exerted to start was 426.5 pounds, being an average per ton of 116.5 pounds. On the old track, with an average of 18.1 passengers, a starting pull of 487 pounds, or 134.6 pounds per ton, was necessary. Briefly stated, then, the power exerted per ton was:

	To start. Pounds.	To keep in motion. Pounds.
On good track	116.5	15.6
On bad track	134.6	32.3

It will be observed from these figures that on good track the pull required to start a car is 7.1 times that necessary to keep the car in motion. On poor track, on the other hand, it is 4.1 times as great. As the results of 103 tests made upon 17 different cars, weighing each with load about 7740 pounds, or 3.87 tons, and assuming a certain length of time spent in stopping and starting, Mr. Wright finds that the horse-power exerted in propelling a car with its average load by a team in its average day's work is 33.53 in starting and 133.22 in maintaining motion, or a total of 166.75. The day's work covers 137.97 minutes, making an average expenditure per team per minute of 1.208 horse-power, or for each horse 0.604 horse-power. These figures show, among other things, that about 20 per cent. of the total power is used in starting a car.

In the matter of cable propulsion Mr. Wright supplies some interesting data arrived at by Mr. D. J. Miller, while connected with the Chicago City Railway. Mr. Miller, it appears, found that at an average speed of 6.85 miles per hour, or 602.8 feet per minute, 1 horse-power was required for each ton of cable and machinery and 0.2 horse-power for each ton of car and passengers. For an average load of 3.87 tons this would equal only 0.774 horse-power, as against 1.2 horse-power given by Mr. Wright, the lower figure in Mr. Miller's determinations being due, very probably, to an unusually clean track and possibly in a measure to an incorrect estimate of the load. The average resistance to traction of 15.6 pounds per ton which Mr. Wright gives agrees very closely with the figures of other investigators, and may therefore be accepted as very nearly correct. Extra resistance caused by curves has, however, been neglected in these calculations, since it was found very difficult to correctly measure the power expended, the readings on the dynamometer varying between 400 and 1000 pounds with the same car and load. Altogether the figures are of the greatest interest and will be gladly welcomed by many who have hitherto vainly sought for such information.

The Harney Peak tin enterprise of Dakota is shrouded in a fog of mystery to those who decline to be humbugged by the ridiculously extravagant statements of persons who appear to be identified with its management. There can be no question that there is a more substantial foundation in these Dakota tin discoveries than any yet reported in the United States. That it is true is not saying a good deal, and it is not yet settled to-day whether the metal can be made at a profit on a large scale. There is one thing which the attempts to develop the Dakota mines has brought out, and that is the astonishing ignorance prevailing concerning everything that pertains to the mining and metallurgy of tin. We have grown callous to the wonderful comparisons made between Cornish, Saxon and Australian deposits and those of the Black Hills, invariably showing how much more valuable in every way the latter are. Now that a few tons of concentrates have been produced, the metal'urgical lore is coming forth. A contemporary gravely spreads the following information before its readers: "Experiments thus far have shown that at a high temperature—say, 600°—it volatilizes, and at a low temperature it crystallizes. It is handled successfully in chemists' crucibles, but to be profitable it must be reduced in large masses, and the precise method of accomplishing this has not yet been devised. That it will be no one familiar with all the facts has reason to doubt." Now, the facts are that the reduction of tin from the concentrates is one of the simplest metallurgical operations, complicated only if wolfram is present in any amount.

British India and the Precious Metals.

In a recent article on the decline of silver we expressed the belief that the large amount of council bills yet to be sold in London during the fiscal years 1886–87 is for the present the chief cause of this remarkable decline. We have now before us an article from the London *Bankers' Magazine* on the drop in the exchange and the trade with India, in which we find certain Indian statistics throwing a flood of light on the influences silently at work in depressing the value of silver through the dealings of India with the outside world, and the great changes to which they have been subject. The average annual import and export of India (merchandise only, in quinquennial periods) was as follows:

	Import.	Export.
1866–1870	£32,652,277	£32,751,742
1871–1875	33,698,746	37,024,737
1876–1880	39,351,751	62,495,518
1881–1885	53,061,655	82,293,111

The average annual excess of export over import was therefore:

1866–1870	£20,099,465
1871–1875	23,325,991
1876–1880	23,143,761
1881–1885	29,231,456

If in payment of excess of exports India had taken silver coin or bars to the full amount, or at least approximately so, this large absorption would have materially contributed toward preventing the serious decline in silver that has been witnessed. Instead of this being the case, we on the contrary find that India gradually takes less silver, and gold rather freely. The average annual net import of silver and gold into India was:

	Silver.	Gold.
1866–1870	£9,429,413	£4,985,528
1871–1875	3,065,497	2,329,400
1876–1880	7,054,199	614,988
1881–1885	6,080,727	4,712,899

The average annual net proceeds of council bills sold in London on India is seen below:

1866–1870	£ 5,371,371
1871–1875	11,364,047
1876–1880	12,886,048
1881–1885	16,026,268

Average rupee exchange at which the council bills were sold:

	Pence.		Pence.
1866–1870	23.31	1879–1880	19.96
1871–1874	22.58	1880–1881	19.96
1875–1876	21.62	1881–1882	19.89
1876–1877	20.51	1882–1883	19.52
1877–1878	20.70	1883–1884	19.54
1878–1879	19 79	1884–1885	19.31

This year the exchange dropped below 17d.

The council bills are drawn on the public treasuries in India for the purpose of creating funds to pay in London the interest on the Indian debt, and on railroad bonds guaranteed by the Government, and for whatever the Indian Government may have to buy in England. Furthermore, money is wanted to pay pensions for Indian account in England, also to cover the expenses there of the families of employees residing in India. In former years, when British capital was being largely invested in railroads in India, the payments made under such loans at times created funds enough to enable the Government to diminish for the time being the council bill valuations, but at present there is less activity in railroad construction. As the purchasing power of silver in India has remained about the same in the interior, in spite of the decline, the export has been stimulated at the ports where gold produced more rupees. Skilled labor commands better wages, but common labor is no higher. The Indian Government feels the depreciation most, its chief income being derived from the land tax, payable in silver, while its expenditure is to a great extent payable in gold. Gold-hoarding has, however, been practiced in India for a number of years past; gold jewelry takes the place of silver ornaments, and the result is that whatever gold India attracts remains there; hence the increased import thereof. The gold absorbed does not circulate in the shape of coin.

It is evident that the silver question—through the complicated influences at work in India's relations with England and the world at large—has become more entangled than ever, and that the less any nation has to do with silver in its monetary affairs the more certain it is to avoid the troubles brought about by its depreciation.

Our Trade with Hong Kong.

While the amount of goods which the United States imports from Hong Kong is comparatively trifling, only $839,503 the last calendar year, against $1,326,973 in 1884, our export thither of domestic merchandise is considerable and rapidly on the increase. Thus we shipped in 1884 $3,436,890 worth; last year, $4,674.956, The fact is that Hong Kong is one of the handiest points for outgoing sailing vessels and steamers to take goods for, and thence either take cargo direct, or, what is more frequently the case, proceed in ballast to one of the many Chinese or other ports in the East and procure a home cargo.

Hong Kong is one of a number of islands situated off the southeastern coast of China, at the mouth of the Canton River, and lies about 40 miles east of Macao. Its length is about 11 miles, its breadth from 2 to 5 miles, its area rather more than 29 square miles. It is separated from the mainland of China by a narrow strait known as the Ly-ee-moon Pass, which does not exceed half a mile in width. The opposite peninsula of Kow-loon was ceded to Great Britain by a treaty entered into by Lord Elgin in 1861 with the Government of China, and now forms part of the colony. Hong Kong possesses one of the most magnificent harbors in the world, having an area of 10 square miles. The city of Victoria extends for 4 miles at the base of the hills which protect the south side of the harbor, and contains upward of 6000 houses of stone and brick. The residences of the English and foreign merchants are numerous, and most of them are large and handsome mansions. The population increased as follows: 1862, 123,511; 1876, 139,144; 1881, 160,402, when there were 115,369 males, including 9356 whites and 45,033 females, including 1624 whites. Of the Chinese population of the colony it is estimated that 40,000 have been born under the British flag. The annual average rainfall is 78½ inches, while the average range of the thermometer is from 43° to 89°.

The colony was first ceded to Great Britain in January, 1841; the cession was confirmed by the treaty of Nankin in August, 1842, and the charter bears date April 5, 1843. Hong Kong is valuable to England mainly as a factory for her commerce with China and as a military and naval station for its protection. Hong Kong is the center of trade in many kinds of goods. Among the principal are opium, sugar, flour, salt, earthenware, oil, amber, cotton and cotton goods, sandal-wood, ivory, betel, vegetables, live stock, granite, &c. The transactions of the tea and silk trade are largely controlled by Hong Kong firms. The Anglo-Chinese traders take a notable part in sending European and American goods throughout China.

As Hong Kong is a free port it is impossible to give a correct return of imports and exports, but the enormous extent of the trade with which it is connected may be approximately estimated from the fact that the amount of shipping, British, foreign and Chinese, which entered the port in 1882 exceeded 5,000,000 tons. Hong Kong is well provided with dock accommodation. There are five docks and three slips which are well supplied with shears, engineers' and carpenters' shops, foundries and every requirement for making large repairs to ships of war and merchant vessels.

There is telegraphic communication with nearly the whole world, and there is very extensive steam communication with Europe, America and Australia. In addition to the regular mail lines of the Peninsular and Oriental Steam Navigation Company and the Messageries Maritimes, which convey the European mails weekly, the Pacific Mail Steamship Company have a fortnightly service via Yokohama, Japan, with San Francisco, and the Eastern and Australian Mail Steam Company have a monthly service with the Australian colonies. The distance from Hong Kong from the following places is about:

	Miles.	Length of voyage.
Amoy	280	36 hours.
Bangkok	1,450	8 days.
Brisbane	5,360	20 days.
Canton	80	6½ hours.
Kobe	1,620	9 days.
Manila	620	3 days.
Macao	40	3½ hours.
Pekin	1,615	10 days.
Saigon	910	3 days.
Shanghai	800	4 days.
Singapore	1,500	7 days.
Sydney (mail route)	5,700	20 days.
Sydney (via Torres Straits)	....	17 days.
San Francisco, via Yokohama	6,480	30 days.
Vladivostock	1,900	10 days.
Yokohama, Japan	1,620	7 days.

There is daily steam communication between Hong Kong, Macao and Canton, and about twice a week with the ports of Swatow, Amoy, Foo Chow, Shanghai and other ports on the coast of China. The communication with Japan is a little over a weekly one.

The number and tonnage of vessels entered at the port of Hong Kong were as follows:

	No. of vessels.	Tonnage.
1875	26,098	3,562,774
1879	27,237	4,122,668
1884	26,763	5,167,231

The government is administered by a Governor, aided by an Executive Council composed of five officials besides the Governor. The Legislative Council is presided over by the Governor, and is composed of the Chief Justice, the Colonial Secretary, the Attorney-General, the Treasurer, the Surveyor-General, the Registrar-General

and five unofficial members, three of whom are nominated by the Crown on recommendation of the Governor, one is nominated by the Justices of the Peace from their body, and one by the Chamber of Commerce. Hong Kong pays £20,000 a year to the Imperial Government as a military contribution.

	Revenue.	Expenditure.
1881	$1,324,456	$1,094,805
1884	1,171,099	1,546,107

The establishment of Hong Kong at the very doors of China has done much toward educating the Chinese in international commercial matters, and, it may be said, toward humanizing them. It has taken a long time, but the result was worth the trouble. Thus, not only the coastwise trade of China was thrown open to all flags, but even river navigation. Now the Chinese are fairly started. They have adopted the telegraph without hesitation, and the next will be railroads, in which, from all indications, the American system will have the preference. It is to commence in a small way with a line to the coal mines, but in a few years is likely to be taken in hand on an extended scale.

Strikers are learning from hard experience that the violence to which they are so prone to resort brings them speedily into the courts. The latest instance is the affair on the Lake Shore Railway, where the striking switchmen took the ground that eight non-unionists who for many years have been in the employ of the company shall be discharged. No question of wages is involved. The issue is simply whether the corporation shall be permitted to employ men of its own selection. In granting an application for an injunction against the strikers, filed in the United States Circuit Court at Indianapolis, Judge Gresham held "that the averments show a right of action against the strikers, because neither States nor combinations of individuals can interfere with complainants' lawful business, which is that of a carrier of inter-State commerce, and that under the act of 1875 the circuit courts have concurrent jurisdiction with State courts. The strikers have no more right to stop or destroy cars containing imported merchandise to be delivered than to stop or destroy cars containing munitions of war or troops of the United States." Judge Gresham thinks that "it is the duty of the Federal court to exert such authority as it possesses to protect the complainants." This conclusion is inevitable. In the Lake Shore affair it is seen again, as in the Southwestern strike and a hundred other instances, that the argument of force is wholly ineffective. By resorting to it the working man at once antagonizes the whole machinery of Government, local, State and Federal, bringing upon himself certain defeat. It would seem as though in Chicago, where no less than 500 chattel mortgages were recently recorded in a single week as a result of strikes, and where for the same reason the pawnshops are full of pledges which it is probable will never be redeemed, it should be apparent that this method of settling labor troubles is about the worst that could be adopted.

Though cylinder condensation is a well-recognized foe to fuel economy in engine practice, it is not always that even the simplest precautions against it are adopted. It may therefore be sometimes well questioned whether steam users are as well aware of the advantages of using dry steam as they ought to be. If steam in a perfectly dry state could be used, cylinder condensation would of course be reduced to a minimum, since dry steam, like any other gas, conducts heat very slowly. With wet cylinder walls, however, due to the use of saturated steam, the moisture will often evaporate freely, taking up the heat necessary for evaporation from the surfaces on which it rests. Still saturated steam, which, incidently remarked, is steam in the critical condition, the slightest loss of heat causing condensation, does not by any means offer the best possible conditions for such condensation, as many popular forms of boilers supply steam which contains a much larger percentage of moisture than is generally supposed. With them it would be advisable and obviously profitable to adopt some arrangement by which the cylinders could obtain a supply of dry steam. Moderate superheating would accomplish the object admirably, but even a judicious planning of the pipe connections, the use of baffle-plates in extreme cases, or the addition of suitable traps, would result in direct benefit.

The publication recently of the annual report of the Tamarack Mining Company is of more than usual interest. The company acquired land near the famous Calumet and Hecla property, and by sinking a 2200-foot vertical shaft struck the edge of the great ore shute from which the latter have extracted their many millions of dividends, and are now taking out copper at the rate of 25,000 tons annually. The Tamarack has as yet opened but little ground, and did not produce for more than a part of the year. It is likely, too, that the necessities of an exceptional amount of development work with a single shaft as its basis of operations interfered somewhat with extraction to full capacity. These points are alluded to because they probably carried costs higher than they would be otherwise. The total amount of rock stamped was 36,129 tons, yielding 1,979,400 pounds of copper, or 2.738 per cent, and yet the entire cost, including mine work, crushing, smelting, freight, commission and Boston expenses, was only 7.494 cents. When it is remembered that the Calumet and Hecla produces rock yielding 4.25 to 4.5 per cent. of ingot and turns out nearly 25 times as much metal, it may be understood how cheaply they must produce their copper. The Tamarack returns admit of a better direct comparison with that great company—the only one on the lake which does not give its shareholders information on its doings—because it works the same ore.

On the Cost of Manufacture of I-Beams in Belgium.

In a recent issue of the *Revue Universelle des Mines* M. J. Wolters, a prominent engineer well known in Belgium and France, has published an elaborate paper on the technical and economical conditions affecting the manufacture of I-beams in Belgium, starting with the ore and fuel. This paper, especially in some respects, is too extended to be given in full, but it contains many data of special interest to those engaged in similar lines of manufacture in the United States. Belgium may be stated to be far in advance of other countries in this special branch, having been a sharp competitor of England for many years, providing, in fact, the greater part of all the girders used in that country. Mr. Wolters estimates that the total output of beams in Belgium is about 120,000 tons. By way of comparison it may be stated that the work of the mills belonging to the combination in this country is probably not more than 50,000 to 60,000 tons. Mr. Wolters' review starts with the assumption that his figures apply to a plant having two blast furnaces, each capable of turning out 100 tons of mill iron a day, and a rolling mill producing on an average 2700 tons of beams a month. It is somewhat striking to learn that Mr. Wolters holds that for beams of ordinary quality it is a question of secondary importance whether the strength of the iron is great or not, He says that the large buyers in England, who are the most imporant customers of the Belgian mills, are generally content with a tensile strength of 20 tons per square inch, and do not stipulate any conditions so far as elongation and contraction of area are concerned. He therefore starts with the assumption that all that is needed is to make pig iron of second grade with a certain amount of mill cinder in the charge. By employing exclusively the "minettes" or oolithic ores of Luxembourg the proportion of cinder may, according to their quality, rise up to 25 to 30 per cent. of the charge. Above that there is the danger that the pig iron becomes too highly charged with sulphur and phosphorus. The ores of the Luxembourg district carry from 0.53 to 0.90 per cent. of phosphorus and only a trace to 0.03 of sulphur. The Belgian cokes rarely carry more than ½ of 1 per cent. of sulphur. The result is that iron produced without cinder mixture carries, according to two analyses, 0.49 per cent. of silicon, 0.63 of sulphur and 1.75 of phosphorus. With 15 per cent. of cinder the contents were 0.95 of silicon, 0.53 of sulphur and 2.49 of phosphorus, the high phosphorus being due to the hot working of the furnace. Mr. Wolters gives a series of additional analyses which show that, other conditions being equal, the irons produced absorb more sulphur and more phosphorus the greater is the percentage of rolling-mill cinder added to the smelting charge, but by keeping within the limits of 25 to 30 per cent. of cinder an iron is obtained the composition of which is as follows when the furnace is running under average conditions: Silicon, 0.20 to 0.30; sulphur, 0.60 to 0.70, and phosphorus, 2.0 to 2 50. These figures are based upon using equal quantities of puddling cinder and reheating cinder. Mr. Wolters gives a number of analyses of these cinders, and then quotes the following to show to what extent the different elements in the iron are eliminated during the puddling and rolling process:

	Pig.	Muck bar.	Finished iron.
No. 1, Silicon	0.21	0.20	0.17
Sulphur	0.82	0.58	0.07
Phosphorus	1.79	0.97	0.78
No. 2, Silicon	....	0.08	trace
Sulphur	0.53	0.10	0.07
Phosphorus	2.40	1.10	0.96
No. 3, Silicon	0.35	....	0.14
Sulphur	0.53	0.04	0.02
Phosphorus	2.04	0.34	0.31

We cannot follow Mr. Wolters' argument against the use of larger quantities of cinder, which it seems some Belgian manufacturers claim to be able to introduce under certain conditions, nor is it, we think, necessary for us to review his chapter on the coking ovens used. Suffice it to say that he estimates the cost of coke per metric ton as follows:

Cost of Coking in Belgium.

	Francs.
Coal	10.84
Labor	0.61
Supplies	0.12
General expenses	0.15
Discounts, &c	0.20
Sinking fund for repairs	0.34
Total	12.26

Nor need we go into the details he gives concerning the construction of the furnaces and the itemized costs relating to the pig iron made. We summarize his figures as follows:

Cost of Mill Pig in Belgium.

	Francs.
Ores and cinder	18.16
Coke	12.84
Labor	2.57
Limestone	0.49
Supplies	0.59
General expenses	0.47
Discounts and financing	0.78
Reserve for repairs	0.33
Total per metric ton	36.23

Thus far Mr. Wolters has only gone into the manufacture and cost of coke and pig iron. He then takes up the manufacture in the rolling mill, and considers first of all what is necessary to produce 2700 tons of beams monthly. He bases it on an average consumption of 1280 kg. of muck bar and rolled iron per 1000 kg. of beams, not taking scrap ends. Therefore the monthly consumption of muck bar and refined iron is 3456 tons. It may be assumed, furthermore, that of this 3456 tons of muck bar and refined iron the latter comes in in the proportion of 16.01 per cent., or, say, 556 tons, so that there would remain to be manufactured 2900 tons of muck bar for the production of 2700 tons of beams. In adopting for the manufacture of refined iron a consumption of 1228 kg. of raw material, nottaking scrap and ends, per 1000 kg. of product, the 556 tons of refined iron would call for the use of 683 tons of raw material composed of scrap and ends of beams, muck bar and single refined iron. The quantity of muck bar required for making the single refined iron would be as follows: In manufacturing muck bar there is an amount of scrap equal to 74 kg. per 1000 kg. of muck bar used. These ends would be a part of the pile of single refined iron taking the place of muck bar. As there are 556 tons of single refined iron to be produced, there would, therefore, be 41 tons of ends to be reworked, so that the quantity of raw material would be reduced by that quantity to 642 tons. If we consider, furthermore, that the manufacture of every ton of beams yields on an average 131 kg. of beam ends, we would arrive at a total production of such ends of 354 tons, which would leave a balance of 228 tons of muck bar required in making the single refined iron.

From what has just been stated the total monthly output of muck bar would have to be 2900 tons for the beams direct and 288 tons for the single refined iron, making a total of 3180 tons. So far as is known there is not a single Belgian works which does produce so much muck bar, while there are some which make easily 2700 tons of beams monthly. Therefore in order to remain within the limits of what is actually done in Belgium it may be supposed that the production of muck bar amounts to only 2400 tons, and that the balance must be bought in the open market. The 2400 tons of muck bar may be made in 26 ordinary puddling furnaces—that is to say, furnaces not provided with a pig preheating chamber. It may be the assumption that these furnaces are served by three 2½-ton hammers and two muck trains. One of these would handle the balls from 17 furnaces and the other from 9. In order to work favorably it would be necessary that one train have the capacity to roll the balls from all the 26 furnaces in case of accident to the other train. With this object in view each of the muck trains should be three-high, with three sets of rolls. The muck bar must be rolled in a special train consisting of one set three-high roughing and the second three-high finishing rolls. The quantity of single refined iron to be made being 556 tons, it can be made in one large furnace. For the manufacture of 2700 tons of beams we assume that the mill has three trains of rolls, each driven by a special engine. The first of these trains would have rolls 0.5 m. in diameter, with four sets, the first containing roughing-down rolls, and the second with the finishing rolls for the section in which the largest quantities are sold. This train is served by four heating furnaces, one of them being in reserve. It is capable of turning out 1000 tons of beams a month. The second train has heavier rolls for other beams and channels of heavier section. It is supplied by two heating furnaces, the other being in reserve, and would turn out 900 tons of beams a month. The other train would be reserved for the largest sizes to be rolled, and would be two-high reversing, only having rolls 0.70 m. in diameter, in three sets. With two furnaces this train could turn out 800 tons a month, and with three might reach 1100 or 1150 tons. In the following only 800 tons will be assumed to be the production. Mr. Wolters does not go into detail of the system of piling used in Belgium, giving only a few instances.

He goes somewhat into details on the construction of puddling furnaces, a matter which, however, does not call for any special notice by us. A more important point is his estimate of cost of muck-bar manufacture. It will be remembered that it would take 26 puddling furnaces to turn out monthly 2400 tons of muck bar, counting 25 days in a month. When the puddling is well managed and the coal is of good quality the consumption of pig of the character described is on an average 1149 kg. per 1000 kg. of muck bar. So that the cost of the iron per ton of muck bar is 41.62 francs. The fuel consumption he bases upon a mixture of two-thirds run of mine, Charleroi first quality coal, and one-third Mons slack, this mixture costing per metric ton 9.82 francs. The consumption being 1035 kg. per 1000 kg. of muck bar, the cost of coal is 10.16 francs. The labor cost is figured out by Mr. Wolters at 8.34 francs per 1000 kg. of muck bar, the details being as follows:

Labor Cost of Making Muck Bar in Belgium.

	Francs.	Francs.
Two foremen (one day and one night foreman at 5.58 francs)		11.70
For each puddling furnace there is a puddler and his helper, the former being paid 2.38 francs and the latter 1.75 francs per metric ton of muck bar. Assuming that the charge of iron is 225 kg. and that 8½ charges will be made in 12 hours, each furnace will turn out 1850 kg. of muck bar per 12 hours so that the wages of puddler and his helper will amount to 7.64 francs for 26 furnaces and 2 shifts, we have therefore		397.28

The 26 puddling furnaces are served by three helpers and two muck trains, the crew of which is as follows:

	Francs.	Francs.
4 hammermen, at	5.12	20.48
3 helpers, at	1.50	4.50
4 ball men, at	3.68	14.72
3 catchers, at	2.80	8.40
3 helpers, at	1.34	4.02
3 pigmen, at	1.60	4.80
9 shearmen, at	1.34	12.06
2 helpers, at	1.34	2.68
2 engineers, at	2.95	5.90
1 foreman, at	2.75	2 75
2 chief weighers, at	3.00	6.00
4 helpers, at	2.75	11.00
Total		97.31
As work goes on in double turns, we have		194.62
Weighing pig iron and delivery at furnaces is done at 22 francs per ton of muck bar, and, as the production is 96 tons double turn, we have		21.12
One weighmaster		2.00
The carrying of coal and fettling, the removal of cinder from furnace hammers and trains, can be done under contract for 0.45 franc per ton of muck bar, making		46.20
Cost of handling 44,200 kg. of cinder		5.97
Loading on cars, cinders, &c		4.50
Unloading coal and ore		6.52
Handling refractory material, &c		0.65
Blacksmiths, &c		22.08
Masonry		22.08
One fifth of roll-turners' wages		7.80
One-fifth carpenters' wages		5.00
One-half track-layers' wages		1.98
One-third rollers		13.08
Miscellaneous labor including locomotive engineer, watchman, &c		11.88
Labor of hands working when mill is idle		29.29
Grand total		800.70

The cost of castings, refractory materials, timber, oil, fettling, blacksmiths, coal, &c., aggregates monthly 15,780 francs. Deducting from this one-third of the castings, two-thirds of the refractory material, one-half of the timber, one fourth of the oil, the whole of the fettling, one-fourth of the miscellaneous articles, the proportion which is required in the manufacture of muck bar is 6518 francs, while that of rolling the refined iron and the beams is 9262 francs. Therefore the cost per ton of muck bar of the expenses named is 2.72 francs per 1000 kg. The general expenses are placed at 75,000 francs per year, a third of which is estimated to go to the muck train, which would make an outlay per ton of 0.87 franc. The discounts and financing call for 0.06 franc per ton, and the sums placed in reserve to cover other than current repairs and renewal of plant is put at 1 franc. Thus we have the costs of muck bar per ton as follows:

Total Cost of Muck Bars in Belgium.

	Francs.
Pig iron	41.62
Coal	10.16
Labor	8.34
Refractory materials, oils, &c	2.72
General expenses	0.87
Discount and financing	0.06
Reserve for repairs	1.00
Cost	64.77

We have given these figures in detail chiefly to show how low are the wages paid in the different departments. Mr. Wolters goes through a similarly elaborate and careful estimate of the costs of single refined iron, and reaches the following summary:

Cost of Single Refined Iron in Belgium.

	Francs.
Consumption of scrap and muck bar	77.88
Coal	3.10
Labor	9.28
Refractories, oils, &c	8.84
General expenses	1.38
Discounts, &c	0.09
Repairs and renewal	1.00
Total	95.56
Deduct for scrap, 74 kg. at 62.43	4.62
Cost	90.94

In a similiar way, too, Mr. Wolters gives full details on the costs of rolling I-beams in a series of estimates covering different classes. We tabulate them as follows:

Cost of Rolling Beams in Belgium.

	1st and 2d class. Francs.	3d class. Francs.	4th class. Francs.	5th class. Francs.	6th class. Francs.	7th class. Francs.	8th class. Francs.
Iron	87.43	90.00	89.97	86.71	86.71	88.37	89.89
Coal	4.57	4.65	4.83	4.80	4.80	5.73	6.65
Labor	8.74	8.74	7.92	7.92	8.25	8.25	8.25
Supplies	2.84	2.84	2.84	2.84	2.84	2.84	2.84
General expenses	1.28	1.28	1.28	1.28	1.28	1.28	1.28
Discounts, &c	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Repairs	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total	105.95	108.60	107.93	104.64	104.97	107.56	110.00
Deduct for scrap	7.43	7.62	8.43	7.61	7.61	8.93	10.18
Balance	98.52	100.98	99.50	97.03	97.36	98.63	99.82
Total iron charged, kg	1271	1278	1295	1264	1264	1288	1311
Percentage of refined iron	15.3	21.6	18.00	14.6	14.6	14.7	14.8
Scrap made, kg	119	122	135	122	122	143	163
Consumption of coal, kg	465	474	491	489	489	583	677

We have tabulated also the quantity of iron piled, the proportion of single refined iron contained in the pile, the scrap obtained for which allowance is made, and the consumption of fuel per 1000 kg. or 1 ton of iron. The basis is the Belgian classification, the first three classes varying in hight from between 3.15 and 8.66 inches; in base from 1.57 to 3.94 inches, and weighing from 4 to 27 pounds per running foot. The fourth and fifth classes comprise beams from 7.87 to 11.81 inches high, with 3.54 to 5.14 inch base, weighing about 20 to about 57 pounds per running foot.

Since the single refined iron costs a good deal more than muck bar, it is to the interest of the manufacturer to get along with as little as possible. The estimates of its consumption upon which Mr. Wolters' statements of cost of manufacture are based are stated by him to be good averages, below which it is not possible to go without making too heavy a proportion of beam ends and defective beams. Many efforts have been made to replace the single refined iron entirely or partially by muck bar superior in quality to that used in the balance of the pile, but nothing equals it to obtain a good product, and Mr. Wolters does not hesitate to add to manufacture cheaply. The following table is given by him as the cost of the beam of the first and second class when the proportion of rolled iron varies from 14 to 25 per cent., using as a basis for the expenditures the same data applied in his elaborate estimate of costs:

Cost as Affected by Proportion of Rolled Iron in Pile.

Francs.	Francs.
14 per cent. 98.07	20 per cent. 100.05
15 per cent. 98.40	21 per cent. 100.38
16 per cent. 98.73	22 per cent. 100.71
16 per cent. 99.06	23 per cent. 101.04
17 per cent. 99 06	24 per cent. 101.37
18 per cent. 99.39	25 per cent. 101.70
19 per cent. 99.72	

The cost therefore increases about 0.33 franc per ton per every increase of 1 per cent. in the proportion of rolled iron used.

Mr. Wolters closes his interesting review with an estimate of the influences of rolling longer beams upon economy in manufacture. He presents a table which shows that per every additional meter the reduction of cost is about 0.17 franc per ton, but he adds that though this does not seem notable the economy is in reality greater, because it does not bring out the saving on the cost of first materials. Then it must be remarked that in rolling great lengths the percentage of seconds is smaller, or, in other words, there is an increase in the output with the same or nearly the same cost of manufacture.

WASHINGTON NEWS.

(*From Our Regular Correspondent.*)

WASHINGTON, D. C., August 24, 1886.

Among the recent important decisions by the Secretary of the Treasury is one of interest to American manufacturers, defining the rules of classification for duty on structural and other iron being parts of buildings. The importers appealed from an assessment of duty at 1¼ cents per pound. The merchandise in question consisted of plain iron beams, riveted lattices, manufactured iron, and T-beams, girders, plain and flanged at the ends and sides; strutting-rods, threaded on the ends, with nuts on; bundles of anchor and brace plates and fish-plates, and boxes containing bolts, nuts and braces. The entire shipment was intended for the flooring of the second and third stories of the Capitol building being erected at Austin, Tex., and was classified as "iron or steel beams, girders, joints, angles, * * * building forms," &c., and "other structural shapes of iron or steel." The appellants claimed that the importation was complete in all its parts, each and every piece being fitted for its proper place, and which has simply been taken apart for the purpose of transportation, and that it should be classified for duty as a manufacture of iron not otherwise provided for. In the case of a large building at San Francisco the structural shapes imported were classified for duty at the rates prescribed for the several articles named. The importation in that case was similar in nearly all respects to this appeal, inasmuch as the building was designed and constructed abroad, and was brought to this country in its several component parts for the purpose of being put together here. In that case the bolts and nuts, which were imported in separate boxes or unattached to the other pieces, were held to be dutiable at 2½ cents per pound, and the department was of the opinion that the same rule of classification should be adopted in this case as to the bolts and nuts included in this importation, and also to any other separate articles for which a more specific provision could be found in other paragraphs than that provided for structural frames. The strutting rods might, if similar in character to the merchandise covered by department's former decision, be classified as bolts under the rule therein established, and the fish-plates or splice-bars might be classified thereunder.

The department decided that the claim of the appellants—that the whole importation should be considered in its entirety as a manufacture of iron, though imported in this separated condition—was untenable and could not be sustained, and to reliquidate the entry as to such of the articles as might be otherwise provided for, and take the necessary steps for collecting the additional duty accruing thereon.

WHEN ROYALTIES ARE DUTIABLE.

In an appeal from a decision including in the dutiable value of an article the cost of royalty paid to the patentee of such article in a foreign country, the Secretary of the Treasury has decided against the appeal, because the royalty was actually so paid to the patentee, and therefore formed part of the cost of the machinery to the purchaser.

PATTERNS FOR MACHINERY NOT ENTITLED TO FREE ENTRY AS MODELS.

An assessment of 35 per cent. as a manufacture of wood having been made on a 19-tooth pinion and core box, claimed as a wooden model, and appeal being taken, the Solicitor of the Treasury, in a letter to the Secretary, says: "I do not think it comes within the scope of this provision of the free list. It is evidently not a model of an invention or improvement in the arts. The term 'model' has a well understood popular meaning, and it is in accordance with such meaning and with the definition given by the customs officers that the provision is to be construed. Taking the meaning of the term in connection with the condition that it must be a model of an invention or improvement in the arts, the conclusion seems to me irresistible that the decision of the collector was correct."

PATENT FUEL DUTIABLE AS COAL-TAR PRODUCT.

On an assessment of 20 per cent. as patent fuel and an appeal for 30 cents a ton as culm of coal, the article in question being a composition of culm of coal and coal-tar pitch, the last-mentioned substance being the material of chief value, not being the culm of coal of commerce, nor assimilating thereto, the claim of the appellant that it should pay the duty prescribed for that substance was rejected, and it was declared dutiable at the rate of 20 per cent. ad valorem for coal-tar products.

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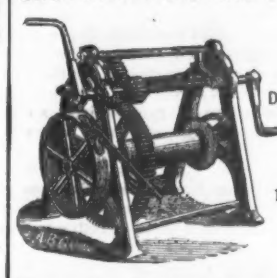

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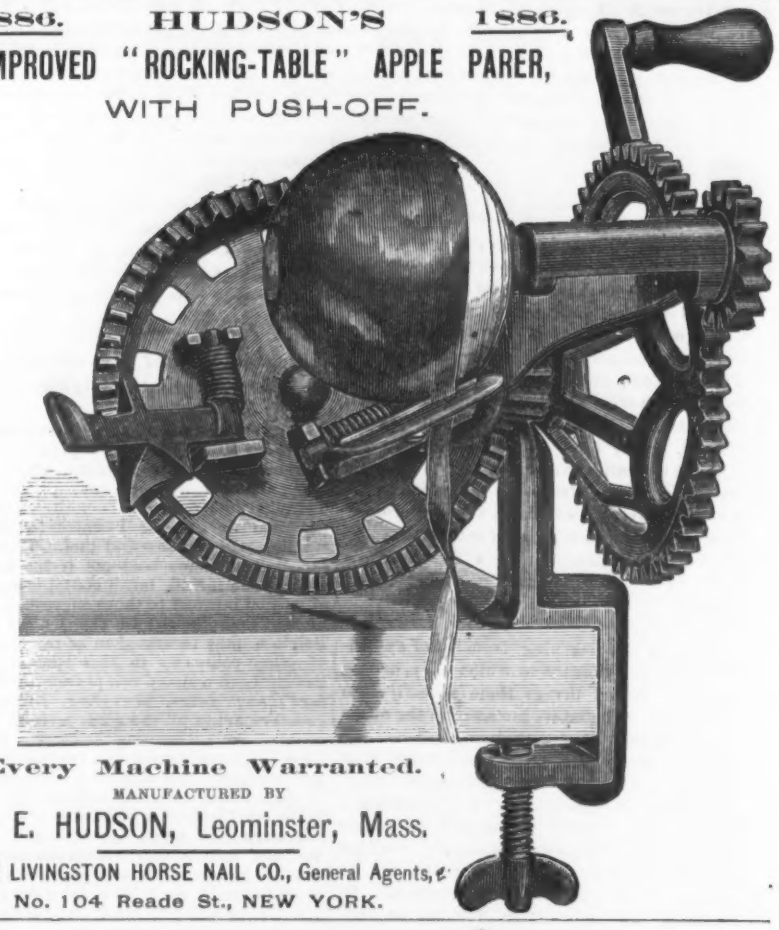

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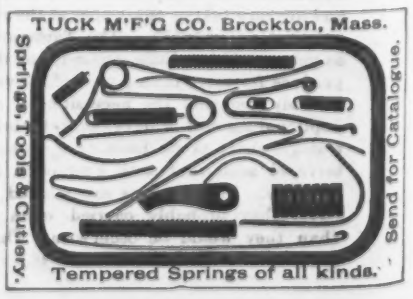

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a thoroughly competent and reliable man who understands the manufacture of Steel-Laid Shears and Scissors to take entire charge of a factory. No one unless able to furnish good references as to ability and habits need answer. A first-class opportunity for a good man. Address for interview, "SHEARS AND SCISSORS."
Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

WANTED.—An old and experienced traveler for Hardware and Brass Goods of all kinds direct for manufacturers desires a position to travel, having an extended acquaintance from coast to coast. Address, "EXPERIENCE," office of *The Iron Age*, 66 and 68 Duane St., New York.

Special Notices.

Machinery, New and Second Hand.

LATHES.

One 17 in. x 6 ft Forsaith Lathe, new.
One 18 in. x 12 ft. " " "
One 16 in. x 6 ft Blaisdell Lathe, new.
One 30 in. x 22 ft. New Haven Lathe, second hand.
One 24 in. x 14 ft. Lodge-Davis Lathe, new.
One 20 in. x 14 ft. " " "
Three 20 in. x 8 ft. Fifield Lathes, new.
One 21 in x 8 ft. " " "
Six 18 in. x 8 ft. Lodge-Davis Lathes, new.
Six No. 3 Plain Hand Lathes, new.
One Cabinet Turret Lathe Am. Tool Co., second hand.
Six 13 in. x 5 ft. Turret Lathes, new.
Six No. 1 Hand Fox Lathes, new.
Six 14 in Fox Monitors, new.
Three 12 in. Fox Monitors, new.
Six 16 in. x 6 ft. Fox Monitors, new.
Six 15 in. x 6 ft. " " "
One 20 in. x 10 ft. Putnam Lathe, 2d hand.
One 16 in. x 5 ft. Engine " "
One 18 in. x 10 ft. Pond " "

PLANERS.

One 30 in x 30 in x 10 ft. Whitcomb Planer, with housing to take 36 in., second hand.
One 30 in. x 30 in. x 8 ft. Pond Planer, second hand.
One 30 in. x 30 in. x 10 ft. Enterprise Planer, "
One 30 in. x 30 in. x 8 ft Whitcomb Planer, "
One 24 in x 24 in x 6 ft. Lodge-Davis Planer, new.
One Belden Crank Planer, new.
One 36 in. x 36 in. x 10 ft. Enterprise Planer, 2nd hand.
One 24 x 24 x 6 in. "Wood and Light" Planer, 2d hand.
One 18 in. x 18 in. x 4 ft. Gould & Eberhardt Planer, second hand.

DRILLS.

One 24 in. Bickford Drill, second-hand.
One L., D. & Co. 20 in. Wheel Feed Drill, new.
Twelve L., D. & Co. 20 in Lever Drills, new.
Two 28 in. Back Geared Bickford Drills, New.
One 32 in. " " "
One 18 in. Prentiss Drill 2d hand.
One 28-inch Bickford Drill, new.

MISCELLANEOUS.

Three 20 in. Lodge-Davis Shapers, new.
Three 26 in. " " "
Four 34 in. x 4¼ in. Grindstones and Frames, new.
Three (Grant & Bogert) Universal Milling Machines, new.
One Sellers' Car Wheel Borer, second hand.
One 14-inch Steptoe Shaper, second hand.

☞ *See Adv't, Page 2.*

LODGE, DAVIS & CO.,
Manufacturers and Dealers, CINCINNATI, O.
Write for prices; it will pay you.

Public Sale of an Iron Furnace.

By virtue of a power of sale contained in a mortgage on the premises the undersigned will offer at public sale, in Hagerstown, Md., on Tuesday, August 31, 1886, at 10 o'clock a. m., the Antietam Iron Works, situated in Washington Co., Md., on the Chesapeake and Ohio Canal, seven miles by canal from the Baltimore and Ohio Railroad at Harper's Ferry, and a few miles from the Cumberland Valley and the Shenandoah Valley railroads. The property consists of a fine brick furnace stack, 50 feet high, with a capacity of from 4000 to 5000 tons of iron per annum. Ample water-power driven by Antietam Creek. The property includes a fine grist mill, a large mansion house, store house and twenty-one tenement houses; a wharf on the canal, 1100 acres of land, an ore mine tract of 92 acres directly on the canal, containing a large quantity of brown hematite ore Terms upon application.
WM. T. HAMILTON, Mortgagee,
Hagerstown, Md.

N. B.—The mining right in 1600 acres of land rich in iron ore, lying convenient to the furnace, fronting several miles on the Potomac River, will be sold by special commissioners at Charlestown, Jefferson Co., W. Va., on Saturday, August 28, 1886.

For Sale.

18 Iron Tanks; 19 x 6 wide; 26 x 3 long; 6⅛ deep; ⅜ Iron.
JAMES McHUGH,
556 N. 23d St., Philadelphia.

WANTED to buy, for Cash, on receipt of Invoice and Bill of Lading, in bulk:

14,000	Plow Bolts,	7-16 x 1 3-8.
20,000	" "	5-16 x 1 1-16.
18,000	" "	7-16 x 1 1-12.
8,000	" Countersunk Bolts,	2 1-8 x 3-8.
16,000	Carriage Bolts,	3-8 x 1 3-4.
7,500	" "	3-8 x 2 3-4.

Confidential quotations will be respected.
R. BALLAUF & CO., Jefferson, Texas.

FOR SALE.

Whole or half interest in a well-established Hardware Store, doing a good business, situated in a rich mining and agricultural community in Central Pennsylvania. Satisfactory reasons given for wanting to sell. Address
"JACK PLANE,"
Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

Wanted.

A Superintendent to take entire charge of a factory which manufactures ornamental wire and iron work, such as wrought-iron fencing and railing, wire counter railings, &c. Must be a practical man of experience in handling workmen, and understanding architects' drawings Good salary and permanent position. Address immediately
"SUPERINTENDENT," Box 118,
Office of *The Iron Age*, 66 and 68 Duane St. New York.

For Sale.

A good Hardware and Tool Business in a leading city in the Northwest, having the largest trade in the city. Stock will invoice about $40,000. Satisfactory reasons given for desiring to sell.
Address "MINNESOTA,"
Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

STAMP MILL FOR SALE.

A Stamp Mill having five stamps. Particulars on application to
THE UNITED STATES MITIS COMPANY,
26 Broadway, New York.

For Sale.

The Works of the Pembroke Iron Company, at Pembroke, Maine. Property consists of a dam and fine water-power, nail factory and rolling mill with a complete plant for the manufacture of all kinds of rolled iron. Persons wishing to manufacture or to buy machinery will find this a rare opportunity. For terms address,
BENJAMIN LINCOLN,
Dennysville, Maine.

FOR SALE.—An old and well-established Hardware business in one of the best locations in Kansas City, Mo. For further particulars address
"NAILS," Box 22,
Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

WE want to get hold of Hardware Novelties in which there is money, to handle exclusively in Canada.
JAMES FOSTER & SONS.,
143 and 145 King St., East,
Toronto.

WANTED.—A position as Blast-Furnace Manager, Assistant Superintendent or other position in Iron or Steel works, in line of promotion, by a young man having had practical experience and a technical education. Address
"X. Y. Z.," Box 19,
Office of *The Iron Age*, 66 and 68 Duane Street, N. Y.

WANTED, a Rolling Mill Manager; one who has had some experience in structural irons.
Address "W.," P. O. Box 33,
New York.

Special Notices.

GREAT BARGAINS IN MACHINERY.

1 30 in. x 72 in. Corliss Condensing Engine.
1 14 in. x 30 in. Corliss Engine. New.
1 12 in. x 30 in. " " "
1 10 in. x 22 in. " Nearly new.
1 12 in. x 18 in. Automatic Cut-Off Engine.
1 10½ in. x 28 in. Slide Valve Engine.
1 9 in. x 16 in. " " " New.
1 8 in. x 16 in. " " " "
1 8 in. x 12 in. Ames Engine. Nearly new.
1 8 in. x 12 in. Portable Engine and Boiler.
1 5 in. x 10 in. Horizontal Engine.
2 10 H.-P. Baxter Engines.
1 4 H.-P. Baxter Engine.
1 5 x 12 Double-Drum Hoisting Engine.
1 100 H.-P. Babcock & Wilcox Boiler.
1 5 x 16 Horizontal Tubular Boiler.
1 3 x 12 " " "
1 42 in. x 10 ft. Locomotive Boiler.
1 48 in. x 14 ft. " "
1 42 in. x 7 ft. Upright Boiler.
1 Hillis & Jones Punch and Shears.
1 Heavy Dialogue Punching Machine.
1 Heavy Flange Punch.
1 Large Styles & Parker Press.
1 Set Rubber Grinding Rolls.
2 22 in. x 10 ft. Engine Lathes. New.
2 16 in. x 6 ft. " Pond.
1 24 in. Gould & Eberhard Gear Cutter.
1 No. 2 Garvin Milling Machine.
1 24 in. Bullard Drilling Machine.
2 Ames 4-Spindle Drills.
1 Pratt & Whitney 4-Spindle Drill.
1 12 in. Heavy Slotting Machine.
1 Double-Spindle Milling Machine.
1 4 in. Morris & Tasker Pipe Threading Machine.
9 Tanks, 8 ft. x 5 ft. x 5 ft. 3 in.
1 Tank, 8 ft. diam. x 8 ft. high.
1 " 5½ ft diam. x 5½ ft. high.
Nos. 3, 4, 5 and 6 Woodward Steam Pumps.

ROBT. J. GRAY,
502 West Street, New York.

METALLURGICAL ENGINEERING.

I am prepared to furnish

PLANS, SPECIFICATIONS and ESTIMATES

AND TO

SUPERINTEND THE CONSTRUCTION OF ROLLING MILLS AND MACHINERY, REGENERATIVE GAS FURNACES, TUBE AND PIPE MILLS, ETC., ETC.

I represent the latest improvements in all the above branches.

M. V. SMITH, Metallurgical Engineer,
Rooms 16, 17, and 18 Bissell Block. Pittsburgh, Pa.

For Sale.

The property and works of the Steel Company of Canada (Ld.), in Liquidation, situate at Acadia Mines, County of Colchester, Province of Nova Scotia, Dominion of Canada.
The property extends to about 33,000 acres, well timbered.
There are two Coke Blast Furnaces, weekly capacity 400 tons; Coke Ovens; Rolling Mill, capacity 200 tons per week; Wheel and general Foundry, capacity 200 wheels per day.
The Mines are fully developed and in first class working order, and the works are now in operation.
The Dominion Parliament has granted a bounty on all Pig Iron manufactured in the Dominion of $1.62½ per ton of 2240 lbs. for three years from 1st of July instant, and $1.12 per ton of 2240 lbs. for three years from 1st of July, 1889.
Also the Chignecto Coal property belonging to the Estate of the Steel Co. of Canada (Ld.), in Liquidation, situate in Cumberland County, Nova Scotia, consisting of a mining area of four square miles, and upwards of 1000 acres of well timbered land, held in freehold.
The Mine is thoroughly equipped with all the appliances necessary for an output of 400 tons per day, and is situated within two miles of the main line of the Intercolonial Railway, with which it is connected by a branch belonging to the property. All in first-rate order.
Application may be made to
A. T. PATERSON,
P. O. Box 2002,
Montreal, Canada.

WANTED.

The following new or second hand Plain Slide Valve or Corliss Engines:

One 16 inches by 30 inches.
One 18 inches by 42 inches.
One 20 inches by 48 inches.
One 22 inches by 48 inches.

Also a Pulley Turning or Grinding Machine to finish to 36 inches diameter.
State full particulars and bottom prices.

H. M. SCIPLE,
Corner Third and Arch Streets, Philadelphia.

FOR SALE.—Foundry and Machine Shop, in good running order, doing a good business.
JOHN C. KILNER,
York, Neb.

AN experienced Hardware Clerk wants a situation in Retail or Wholesale House. Best of references. Speaks German and English.
Address E. T. D MILLER,
1814 Mervine St., Philadelphia.

WANTED.—A position as Superintendent, Manager or Founder for one, two or more Furnaces, by an experienced practical man First-class references given.
Address M. S. BRINTON,
Box 131, Geddes, Onondaga Co., N. Y.

Wanted.

A Traveling Salesman who is thoroughly acquainted with the Iron and Steel business, and who can command a trade in that line, to travel for a Philadelphia house. Address, with full particulars and references,
"IRON AND STEEL,"
Box 1086, Philadelphia

Wanted.

A competent Draughtsman accustomed to Steel Works construction and Steam Engineering.
Address, stating salary expected, experience and references,
"DRAUGHTSMAN,"
Lock Box, 1086, Philadelphia,

WANTED.—A position as designer and draftsman or superintendent by a mechanical engineer of long experience in originating all classes of new machinery, both light and heavy including sewing machine and gun work, engines and boilers of every style; accustomed to manage help and details of construction, to make estimates of cost and bills of material. Address "M. E.," 144 East Bridge Street, Oswego, N. Y.

Special Notices.

Second-hand Machinery in Good Order. For Sale Cheap.

1 Engine Lathe, 48 in. x 20 ft. bed.
1 " 36 in. x 18 ft. "
1 " 28 in. x 15 ft. "
1 " each 24 in. x 20 in. and 24 ft.
1 " 24 in. x 12 ft. bed. Fifield.
1 " 22 in. x 12 ft.
1 " 20 in. x 8 and 10 ft. bed. Putnam.
1 " 18 in. x 9 ft.
1 " 15 in. x 6 ft. Porter. Rod feed only.
1 each " 16 in. x 6, 8 and 12 ft.
1 " " 13 in. x 6 ft.
1 " " 12 in. x 5 ft.
2 " " 13 in. x 5 ft. Wm. Sellers & Co.
1 each " 11 in. x 4 and 5 ft.
1 " " 10 in. x 3½ ft. Foot power.
1 " " 11 in. x 4 ft.
1 Planer, 17 in. x 17 in. x 3½ ft.
1 " 20 in. x 20 in. x 4 and 5 ft.
1 " 36 in. x 36 in. x 7 and 10 ft.
1 " 30 in. x 30 in. x 8 ft.
1 " 24 in. x 24 in. x 5 and 6 ft.
1 " each 42 in. x 42 in. and 9 and 10 ft.
1 " 26 in. x 28 in. x 5½ ft
1 " 36 in. x 24 in. x 6 ft.
1 Shaper, 15-in. stroke. Hendy.
1 Shaper 14 in. stroke Gould & Eberhardt.
1 Shaper each 12, 15, 20 and 28 in. stroke.
1 Crank Planer.
1 32-in. B. G. & S. F. Drill.
1 each Upright Drill, 20 and 24 in., with Back Gears.
1 Lincoln Pat. No 2 Miller.
1 Index Miller. Pond.
1 each 3, 6 Spindles, No. 0 Drills. P. & W. Co.
1 each Nos. 1 and 2 Screw Machines. Wire Feed.
1 Pratt & Whitney.
1 No. 3 Screw Machine. Plain. P. & W.
1 375-lb. Drop Hammer. Beecher & Peck.
1 No. 52 Ferracute Press.
10 Foot Presses, assorted.
8 Power " "
12 Punching and Shearing Machines, assorted.
2 Return Tubular Boilers, 35 H.-P.
1 Vertical Boiler, 25 H.-P.
2 Hoisting Engines, 8 and 10 H.-P.
1 Small Hand Miller.
1 No. 2 Hand Miller. Pratt & Whitney.
1 Horizontal Engine, each 25 and 45 H.-P
1 Vertical Engine, 10 H.-P.
1 Die Sinking Machine.
1 48-in Boring and Turning Mill. Pond.
1 40-lb. Bradley Hammer.
1 12-in. Shaper, 2 Tables. Betts.
1 No. 4 Baker Blower.
1 Suspension Drill.
2 Screw Presses.
1 Rogers Wood Planer, 24 in. x 5 in.
1 Valve Miller.

Also full line of New Machinery.
New York Agency TAYLOR MFG. CO., Engines, Boilers, &c. Correspondence solicited.
PRENTISS TOOL AND SUPPLY CO.,
P. O. Box 3362, No. 42 Dey St., New York City.

For Sale.

Foundry, 100 x 40 ft. and Machine Shop 60 x 20 ft., both with water privilege; also Japan and Packing House 62 x 22, Stove Storehouse 50 x 14 and Storehouse and Box Shop 30 x 20. All in good repair and running order; five minutes from steamboat and ten minutes from two railroad stations. Address
WILLIAM KEIGHLEY'S EST.,
Middle-Haddam, Conn.

FOR SALE.

Large lot second-hand Iron Tanks, all sizes and shapes, from 5000 gals. down, and lot new 100 gal. Oil Tanks with pumps, all complete. Patterns for Rolling Mill Shears complete. Lot of Boiler Shells, different sizes. Cast Iron Kettles, cheap. Second hand Engines and Boilers, cheap. Wrought and Cast Scrap, Red and Yellow Brass, Copper, Lead and Zinc. BUSSENIUS, CUNLIFFE & CO.,
Dealers in Scrap Iron and Old Metals,
12th and Washington Ave., Philadelphia.

FOR SALE.

BAKER BLOWERS, Nos. 4 and 5.
ROOT BLOWERS, Nos. 1, 3, 4, 5 and 7.
STURTEVANT do., Nos 3, 4 6, 7, 8 and 9.
RIDER HOT-AIR PUMPING ENGINE, 10-inch.
GAS ENGINE, 1 Horse Power. Careful attention given to purchasing for parties out of the city. Correspondence solicited. C. R. BIGELOW, M. E.
45 Dey St., N. Y. City.

Iron Mill for Sale at a Sacrifice.

A Rail Mill completely equipped for manufacturing Rails, and well adapted to making Bar and and Plate Iron and Nails, is for sale at about one-fifth its cost. It is located on the Mississippi River, near a large city, with both rail and water transportation. Buildings, Engines and Machinery are new and of the best quality, with ample power. Full particulars by addressing
"IRON MILL"
care *The Railway Age*, Chicago.

BOLT HEADER FOR SALE.

A second-hand Lewis, Oliver & Phillip's Bolt Header for sale; in working order; will be sold cheap. Address
THE PHOSPHOR-BRONZE SMELTING CO., LIMITED,
512 Arch St., Philadelphia, Pa.

For Sale, Machinery.

Heavy Geared Milling Machine. New, $450.
15 in. x 6 ft. Engine Lathe " $200.
16 in. x 9 ft. " " $225.
17¾ in. x 9 ft. " " $240.
20 in. x 8 ft. " " $275.
26 in Back Geared Drill Press, heavy. New, $160.
Suspension " " 2nd-hand, $50.
12-in. Crank Planer. New, $250.
Shapers, Planers, Chucks and Tools. Prices low.
AMERICAN TOOL CO.,
Cleveland, Ohio.

For Sale.

A valuable Furnace Property, including the famous Dorsey Ore Bank, at Barre, Huntingdon County, Pa.
Apply to
THE PROVIDENT LIFE AND TRUST COMPANY OF PHILADELPHIA.
409 Chestnut Street.

Cash Advances Upon Iron.

PENNSYLVANIA WAREHOUSING AND SAFE DEPOSIT CO.,

Girard Building, 3d St., below Chestnut, Philadelphia.

This Company is prepared to establish yards throughout the iron regions at small cost, and to make advances at moderate rates of interest.
F. R. PEMBERTON, *President.*
JOHN MASON, *Jr., Treas. and Secy.*
GEO. H. EARLE, Jr., *Solicitor.*
Directors.—Clayton French John H. Converse, John H. Catherwood, George T. Lewis, John W. Hoffman, Edmund H. McCullough, F. R. Pemberton.

BRITISH PATENTS secured daily. Provisional protection (12 months), 50/; to complete patent, £6. 10/, including tax, drawings and all charges. Full patent taken at first, £8. 20/. No extras. Write for circular. Patents sold or licensed. S. S. BROMHEAD, C. E., Mem. Soc. Arts, Patent and Registration Agent, 97 Newgate Street, London, England.

SITUATION WANTED.—A man of 20 years' experience and thoroughly posted in the hardware business wants a position with a first-class house. Best of reference given. Address,
"STEWART,"
Office of *The Iron Age*, 38 Clark St., Chicago, Ill.

Special Notices.

MACHINERY, SECOND-HAND AND NEW, ON HAND

16 in. x 42 in. Planer. Bridgeport. New.
18 in. x 3 ft. " Wheeler. Good.
20 in. x 4 ft. " New Haven. Good.
24 in. x 4 ft. " Thayer & H. Good.
24 in. x 6 ft. " Powell. New.
24 in. x 8 ft. " Ames. New.
26 in. x 6 ft. " Putnam. Good.
26 in. x 6 and 8 ft. Planers. Powell. New.
32 in. x 10 ft. " Pond. Nearly new.
34 in. x 10 ft. " P. & W. Nearly new.
12 in. x 5 ft. Engine Lathe.
14 in. x 5½ ft. " Harris. Good.
15 in. x 6 ft. " Wood & Light. Good.
16 in. x 6 ft. " Ames. Good.
16 in. x 6 ft. " Blaisdell. New.
18 in. x 9 ft. " Belden. A 1.
18 in. x 12 ft. " Wright & Smith.
19 in. x 10, 12 and 14 ft. Engine Lathes. Pond. Nearly new.
20 in. x 10 ft. Engine Lathe. Blaisdell & Harris.
20 in. x 12 ft. " Harrisburg. Fair.
34 in. x 12 ft. " Harrisburg.
32 in. Upright Drill, Back Geared and S. F. Pond Nearly new.
20 in. Upright Drill Plain. Prentice. New.
12 in. stroke Sellers' Traveling Head Shaper.
24 in Shaper. Hendey. A 1.
15 in. and 24 in. Shapers. Wolcott. New. 10, 15, 20 in. Shapers. G. & Eberhardt.
Pratt & Whitney Die Sinking Machine. New
Lincoln Pattern Milling Machine.
Lincoln Pattern No. 3 Milling Machine. P. & W. New
Pond Index Milling Machine. A 1.
Nos. 3½ and 4 Stiles Presses.
No. 3 Double Crank Bliss Press.
No. 6 Wilder 20-in. Punch Press.
36-in. Bliss Squaring Shear. Power. Extra Heavy. A 1.
25 and 40 lb. Bradley Hammers.
Two Bradley Forges, No. 2. A 1.
50-in. Vertical Boring and Turning Mill. A 1.
72-in. " " " 2 Heads. New.

If you do not see what you want, write and specify just what is required. We have other machines not enumerated above.

E. P. BULLARD,
14 Dey Street, N. Y.

SCRAP IRON.

We buy all kinds of Iron and Stee Scrap, Burnt Iron, Old Rails, &c., &c. Write us, naming quantity, price, &c.
ROBINSON & ORR,
115 Water St., Pittsburgh, Pa
(Established 1859.)

IRON AND STEEL SCRAP

Bought and Sold.

JAMES H. LOGAN,
Pig Iron Commission Merchant,
93 Fourth Ave., - - PITTSBURGH, PA.

SCRAP IRON.

We buy all classes of Iron and Steel Scrap Wrought Turnings, Cast Borings, Burnt Metal, &c
GEO. A. McLEAN & CO.,
Room 28, Lewis Block, P. O. Box 455,
Pittsburgh, Pa.

NOTICE.

We buy and sell all classes of Iron and Stee Scrap. Correspondence solicited.
JOS. C. POULTERER & CO.,
204 S. Third St., Philadelphia

Cotton Gin Ribs.

HARDWARE MERCHANTS

and others furnished with materials of all kinds for making and repairing COTTON GINS, RIBS and SAWS for repairing ALL makes of gins. Send for Price List. Address THE BROWN COTTON GIN CO., Manufacturers of Cotton Gins Feeders and Condensers, New London, Conn.

FOR SALE.

Three-Spindle Nut Tapper, Hoop Iron Testing Machine, Column Milling Machine 16 in. x 8 ft. Lathe, Small Slotter, Ames Gear Cutter, two Bolt Cutters.

A. G. BROOKS,
261 North Third Street, - Philadelphia.

For Sale.

Price $1000—Patent Patterns and Dies of a useful article in hardware, which has been introduced to the trade with promising results. Parties manufacturing specialties will find this a profitable investment. Address
"T. P. S.,"
66 Hanover Street, Bridgeport, Conn.

Bargains in Machinery.

One 20 x 48 Horiz. Corliss Engine.
One 10 x 24 Slide Valve "
Four Horiz. Tubular Boilers, 80 H.-P.
One " " " 60 H.-P.
Four " " " 50 H.-P.
One Iron Planer, 26 x 26 x 7 ft.
One " " 24 x 24 x 5½ ft.
One " " 24 x 24 x 5 ft.
One Engine Lathe, 36 in. swing, 12 ft. bed.
One Gear Cutter, will cut 42 in.
D. B. CRUICKSHANK,
243 Dyer St., Providence, R. I.

FOR SALE.

Parties intending manufacturing Tools or Machinery will find it worth while to examine the property known as the Stirling Chain Works, Buffalo, N. Y. The plant can very readily be adapted to other purposes as well as to those for which it was originally intended. The location is eligible in all respects. Descriptive circulars will be sent on application to
JOHN OTTO & SON, Buffalo, N. Y.

For Sale.

Damaged Band and Rod Iron. For sale low or in exchange for Scrap Iron or Scrap Steel.
DAN'L W. RICHARDS & CO.,
Dealers in Scrap Iron, Scrap Steel and Metals,
92 Margin St., New York.

Wanted to Buy

Iron and Steel Scrap of all descriptions, such as Old Iron and Steel Wire Rope, Burnt and Malleable Iron Rails, &c. &c.
We have for sale Pig Iron, Merchant Bar Iron Sheet Iron Nails, &c.
SITES, GILL & CO.,
222 and 224 So. Third Street,
Philadelphia, Pa.

Manager Wanted

for an Anthracite Furnace; one sufficiently familiar with chemistry to analyze his own stock and products preferred. Address, stating age, experience and references,
"B."
Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

Trade Report.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, August 25, 1886.

Scotch Pig.—The market shows no sign of change. Prices remain the same as last week, viz.:

Coltness, alongside, Glasgow			46/6
Langloan,	"	"	43/
Gartsherrie,	"	"	43/
Carnbroe,	"	"	41/
Glengarnock,	"	Ardrossan	42/
Eglinton,	"	"	39/6
Dalmellington,	"	"	39/6
Shotts,	"	at Leith	43/6

Carriage from Ardrossan to Glasgow is 1/ ₱ ton.

Cleveland Pig.—The market continues firm, as reported last week, with no change in prices. We quote as follows:

Middlesboro', No. 1 Foundry		32/6
" No. 2 "		31/9
" No. 3 "		30 @ 30/6
" No. 4 Forge		29/6

Bessemer Pig—The market is a little steadier; no change in quotations. W. C. Hematites, 42/ for mixed lots, Nos. 1, 2 and 3, equal portions, f.o.b. shipping ports.

Manufactured Iron—The market is a little steadier. Quotations are as follows:

	£	s.	d.		£	s.	d.
Staff. Ord. Marked Bars	7	0	0	@	7	10	0
" Medium "	5	10	0	@	6	0	0
" Common "	4	17	6	@	5	5	0
Hoops, 20 W. G. and over.							
" Common Best	6	15	0	@			
" Medium	6	0	0	@	6	10	0
" Common	5	5	0	@	5	15	0
Sheets, 20 W. G. and under.							
" Ordinary Best	7	5	0	@	8	0	0
" Common	6	5	0	@	7	0	0

Steel Rails.—The market is steady at prices quoted last week, viz.: £3. 7/6 @ £3. 10/, f.o.b. shipping ports.

Old Rails—The market is not so steady, and may be quoted 2/ lower, viz.: Old D. H.'s, c.i.f. New York, 53/.

Scrap.—No change to report in this market. We quote Heavy Wrought, 50/; Bessemer Crop Ends, run of mill, 54/ @ 56/, c.i.f. New York.

Copper.—There is no change to note in this market. Best Selected, £42. 10/ @ £43. 10/, and Chili Bars, £39. 5/ @ £39. 15/.

Tin.—The market is steady, with a higher range of quotations, viz.: Straits, spot, £98. 5/ @ £99, and futures £99 @ £99. 10/.

Tin Plates.—The market is not so steady, and we quote 6d. lower for Coke Seconds:

Tin Plates, 10x14,	1st qual.	Charcoal	18/	@ 19/
" "	2d "	"	16/	@ 17/6
" "	1st "	Coke	15/	@ 15/6
" "	2d "	"	13/6	@ 14/

Spelter.—No change whatever to report in this market. Ordinary at shipping ports, £13. 15/ @ £14.

Freights.—Steam from Glasgow to New York, 5/.

Financial.

Office of *The Iron Age*,
WEDNESDAY EVENING, August 25, 1886.

The general business situation throughout the country has shown no especial change during the week, and the outlook may be regarded as fairly satisfactory. The principal features affecting the financial situation have been the call for Government bonds and the large shipments of gold that have been made from the other side, due to the purchases of stocks and wheat on foreign account. The amount of gold shipped is believed to be over $5,000,000. The call for bonds and the gold shipments will have the effect of increasing the amount of loanable funds available, and will thus relieve the stringency in the money market. In the dry goods trade business is moderately active, and the general tone of the market remains very firm. Western and Southern retailers continue purchasing freely their fall and winter goods which is an encouraging feature, as it denotes a confidence in the stability of prices. In cotton goods there is a moderate demand for staple lines, and a fairly good distribution is being made by leading jobbers. Commission houses report a moderate demand for woolen goods, though a conservative policy is noticeable among buyers. Prices are firm in all lines. The outlook in the grain markets is uncertain, in view of the possible political disturbances in Europe. The latest estimates of the probable demand from the United Kingdom and France are 150,000,000 to 155,000,000 bushels for the former and 60,000,000 to 70,000,000 bushels for the latter. It is reported that the world's supply, which for some years has been in excess of demand, is this year barely equal to it, owing to the reduced acreage following the low prices that have prevailed. The visible supply of wheat August 21, according to the New York Produce Exchange statement, was 39,820,852 bushels, an increase of 1,803,449 bushels as compared with a year ago.

The foreign exchange market closed dull and a trifle higher last week, but opened firm this week. Later the market was weaker. The posted rates for bankers' sterling were $4.82 @ $4.84.

The Stock Exchange markets have been irregular and unsettled at intervals this week. Thursday the market was strengthened by the report of gold shipments from abroad, and Friday prices advanced still further, closing strong. Saturday the market opened irregular, and was dull throughout the day. Delaware, Lackawanna and Western was specially active and contributed one-sixth of the number of shares traded in. There was very little business done on the Stock Exchange on Monday. The renewal of the strike on the Broadway street cars and a lower market in London had a depressing effect on prices. Tuesday the market was strong, closing at the highest prices of the day. The features were the coal shares, Western Union, New York and New England, Manhattan and the San Francisco stocks. Today the stock market was irregular and a trifle lower. Quotations as follows: Canada Southern, 43½; Canadian Pacific, 65⅜; Hocking Valley, 29⅛; Consolidated Gas, 80; Lackawanna, 128⅜; Delaware and Hudson, 99½; Erie, 31⅜; preferred, 74; East Tennessee, 14½; Green Bay, 12¾; Kansas and Texas, 31¼; Lake Shore, 85¾; Louisville, 44; Missouri Pacific, 108¾; Chatham, 66; New York Central, 108½; New York, Chicago and St. Louis, 9⅜; New York and New England, 44⅛; Norfolk and Western, preferred, 43¼; Northwestern, 113⅜; Northern Pacific, preferred, 58⅝; Oregon and Transcontinental, 31⅛; Pacific Mail, 56; Peoria, Decatur and Evansville, 29; Reading, 24¾; San Francisco, 28; preferred, 58; St. Paul, 91⅛; Omaha, 46; preferred, 109½; Texas and Pacific, 14; Union Pacific, 54⅝; Wabash, 19; preferred, 33; Western Union, 65⅞; Burlington and Quincy, 134⅞; Manhattan, 140; Jersey Central, 53¾.

United States bonds closed as follows:

	Bid.	Asked.
U. S. 3 per cents	100½	—
U. S. 4½s, 1891, coupon	110¾	111⅛
U. S. 4s, 1907, coupon	126¾	126⅞
U. S. Currency 6s, 1895	126	—
U. S. Currency 6s, 1896	128	—
U. S. Currency 6s, 1897	130	—
U. S. Currency 6s, 1898	132	—
U. S. Currency 6s, 1899	134	—

The bank return for the week shows a further decrease of $473,350 in surplus reserve, which now stands at $6,738,875, against $58,341,475 at the same time last year, and $31,649,550 at the corresponding date in 1884. The loans show a loss this week of $7,017,500, the specie is up $796,800, the legal tenders are decreased $4,055,800, the deposits other than United States are down $11,142,700, and the circulation is increased $10,700.

The Acting Secretary of the Treasury on the 19th inst. issued the 141st call for the redemption of bonds. The call is for $15,000,000 of the 3 % loan of 1882, and notice is given that the principal and accrued interest of the bonds will be paid at the Treasury of the United States in Washington, October 1, 1886, and that the interest on said bonds will cease on that day. All called bonds will be redeemed at the Treasury Department at any time before maturity, with interest to the date of presentation. The previous bond call of $10,000,000 affected the circulation of the national banks more than any previous one, $7,047,750 out of the whole being held as security for circulation, and $749,000 for deposits. The circulation of national banks has not been reduced by bond calls during the last two years so much as was anticipated, the total reduction from July 1, 1884 to August 18, 1886, having been only about $34,000,000, as will be seen from the following statement of national bank notes outstanding:

	July 1, 1884.	July 1, 1885.	August 18, 1886.
Currency	$338,884,274	$318,631,328	$305,130,623
Gold	615,609	438,604	306,569
Total	$339,499,883	$319,069,932	$305,437,192

Future bond calls will affect the bank circulation to at least as great a degree, thereby affording an opportunity to the small silver certificates to take the place of the bank notes retired. It is reported from Washington that the condition of the Treasury is such that another bond call of $15,000,000 is expected to be made before very long. The statement of assets and liabilities for July 31 showed an increase of the funds available for the reduction of the debt of about $7,000,000 over the balance on June 30, the total balance being about $80,000,000, excluding the minor coin.

The Clearing-House statement shows a further improvement in New York exchanges. The clearances for the week ending August 21 were $613,522,864, as compared with $612,310,561 for the week previous, which is an increase of $1,212,303.

There were 139 failures in the United States reported to *Bradstreet's* during the week, against 132 in the preceding week, and 180, 176, 179 and 148 in the corresponding weeks of 1885, 1884, 1883 and 1882 respectively.

The imports of merchandise at this port during the week were $637,863 above those of the previous week, the total valuation being $8,610,053, making the aggregate since January 1st $275,925,724, as compared with $249,547,087 for the same time last year and $287,459,042 in 1884. The exports of merchandise at this port were $880,270 above those of the previous week, the total being $6,429,916, making the aggregate since January 1st $203,727,414, as against $215,280,613 for the same time last year. The items include 917,600 bushels of wheat, 184,140 bushels of corn, 6,627,989 gallons of petroleum, 4181 bales of cotton.

According to the Custom-House report the imports of specie at this port during the week were $380,461, making a total since January 1 of $6,910,804, as compared with $7,638,034 during the same time last year. The exports for the week were $166,382, making a total since January 1 of $43,233,603, as compared with $18,060,500 for the same time last year.

The following crop summary appears in the current issue of the *Farmers' Review*: "The tenor of the reports from the corn belt, while indicating a slight improvement in some sections, does not show any particular change for the better. The general situation in Illinois and Iowa has also been aggravated by the presence of chinch bugs. The yield in Illinois does not promise to exceed one-half that of last year, while that of Iowa will be about 60 per cent. of last year's crop. In Minnesota, Nebraska, Michigan, Ohio and Indiana the condition of the growing corn is still reported as averaging fairly well. In Wisconsin, Missouri and Kansas the general outlook is poor, but sufficient data are not at hand to make any close computations as to the probable yield. There has been nothing in the reported threshing of wheat to indicate any special change in the estimates heretofore made regarding the output for the entire country, namely, from 416,000,000 to 420,000,000 bushels. The yield of Dakota, Washington Territory and Oregon will fall short of the estimates heretofore published."

The detailed report of the Agricultural Department on the condition of the growing crops says that the August returns shows an improvement in wheat in the Northwestern States, compared with the report for July. The harvest is two weeks earlier than usual, and the quality is unusually good, except in sections where heavy loss has occurred from blight. The general average condition of the wheat crop is placed at a fraction over 80.

Metal Market.

Copper—Has been unusually strong during the week, and there has been more disposition to buy futures at a premium over spot prices. For spot, August and September there are buyers at 10¼¢, but Lake Ingot is held at 10⅜¢; for October 10⅜¢ is obtainable; for November 10.45¢ is bid; for December 10.55¢. January delivery has been done at 10.60¢, and the same price is bid for delivery up to May, 1887, but none is to be had under 10¾¢. Arizona Copper Company's Pig is quoted 9¢, and Ingot 10¢. In England Best Selected remains steady at £43. The Chile Bar fluctuations in London have been as follows: August 19 and 20, £39. 7/6; 23, £39. 5/; 24, £39. 7/6, and this morning £39. 10/. The import into England during the first seven months has been 71,102 tons Fine, against 77,353 last year, and the export 36,922, against 37,725.

Tin.—Fluctuations in this market have been extremely small during the past week, London having varied only between £98 and £98. 10/, spot. We have thus had a dull and uninteresting market, a few unimportant lots of spot and August delivery having been taken at 21.65¢, but since then a recovery has taken place. Yesterday 21.75c was bid and refused, and this is the nominal closing quotation to-day, London meanwhile coming £98. 10/, spot, and £99. 7/6, three months. The consumptive demand in this city has been extremely heavy in spite of the stagnation in the wholesale market, which proves that consumers, having continued their hand-to-mouth business, find themselves under the necessity of filling up their needs even before the pressure of demand from the interior can reasonably be expected. In this manner there is an anxiety to secure Tin, and not so much a question of price. Shipments from the Straits Settlements to the United States first six months, 31,533 piculs, against 16,051 last year same time. *Tin Plates.*—There has been a fair demand and some little business done for forward delivery. We quote at the close large lines, ordinary brands, per box: Charcoal Bright, $4.70 @ $4.90; do. Ternes, $4.20 @ $4.30, and Coke Tin, $4.35 @ $4.45. Liverpool is steady; Coke, 13/3 @ 13/6, and Charcoal 15/6 @ 16/6.

Lead.—Sales figure up in a small way a couple of hundred tons at 4¼¢, but larger lines could at the close probably not be got under 4.80¢. The fact is that London is advancing under a scarcity of Spanish Lead, and that Foreign cannot be laid down here for less than 4⅞¢. London quotes Soft Spanish £13, and English Pig £13. 7/6. The St. Louis market is 4.60¢, and that of Chicago 4.65¢. Corroding Lead would not be obtainable in New York for less than 4.85¢. The general situation is an essentially strong one, and we now expect the fall demand to soon set in vigorously.

Spelter and Zinc.—Nothing has happened to disturb the monotony of the market for Common Domestic Spelter, which is quiet and nominal at 4½¢, but meanwhile the London market continues in its gradual downward course, being again 2/6 off, and now coming £13. 15/. We quote Silesian unaltered, nominally 4.70¢. Bertha Refined is worth 8¢.

Sheet Zinc—Is quiet at 5.60¢ @ 5.85¢.

Antimony—Cookson has been active at 9.10¢ @ 9.25¢, and Hallett dull at 7¼¢ @ 8¢. London quotes the latter £30.

New York Metal Exchange.

The following transactions are reported:

MONDAY, August 23.

10 tons Tin, August	21.65¢
25,000 ℔ Copper, September	10.25¢
37,500 ℔ Copper, December	10.50¢

TUESDAY, August 24.

25,000 ℔ Lake Copper, January	10.80¢

Louisville.

LOUISVILLE, KY., August 23, 1886.

Pig Iron.—The market for all kinds of Pig Iron since our last report has shown a steady tone and prices are firmly adhered to. It would seem that, if this condition of things should be maintained for any length of time, with the scarcity of some grades of Southern Iron, there certainly would be a slight advance over present quotations. Furnaces in the South are well sold up, and, in fact, some of them have no Iron to offer at all for the next 30 or 60 days, being considerably behind on Iron already sold ahead, and are showing a strong disposition to decline orders for Iron beyond 60 days at present quotations. Indeed, some of them decline to sell ahead at all. The following quotations are strictly adhered to:

Charcoal Foundry.	
Hanging Rock, No. 1	$21.00 @ $22.00
Hanging Rock, No. 2	18.50 @ 20.00
Southern, No. 1	17.50 @ 18.50
Southern, No. 2	16.50 @ 17.50
Southern Mill	15.50 @ 16.00
Coke.	
Hanging Rock, No. 1	17.00 @ $18.00
Hanging Rock, No. 2	16.00 @ 17.00
Ohio Softeners, No. 1	18.00 @ 20.50
Ohio Softeners, No. 2	17.00 @ 19.50
Hanging Rock Softeners, No. 1	16.50 @ 17.00
Hanging Rock Softeners, No. 2	15.50 @ 16.00
Southern, No. 1	16.50 @ 17.50
Southern, No. 2	15.50 @ 16.00
Southern, No. 2½	15.00 @ 15.50
Southern, No. 1 Forge	14.00 @ 14.50
Southern, No. 2 Forge	13.50 @ 14.00
Wheel Irons.	
Hanging Rock, Cold Blast	24.00 @ 25.00
Hanging Rock, Warm Blast	19.00 @ 20.00
Red River, Cold Blast	23.00 @ 24.00
Southern, Cold Blast	23.00 @ 24.00
Southern, Warm Blast	17.00 @ 23.00

W. B. BELKNAP & Co., Louisville, write as follows, under date of August 23: The activity in all sorts of business which the trade journals and dailies as well have been quick to perceive and note still continues and promises to hold out until the high tide of fall trade shall have passed. The recovery of confidence incident to the settling of labor troubles, the increased earnings of the railroads—and, in fact, of almost all lines of business—have made capital more bold and aggressive; hence the great idle reserves have been drawn on and millions put into active circulation. The extraordinary fact still continues that prices fail utterly to respond to this large movement. It would seem as though manufacturers had been running so long on starvation diet that, like Dr. Tanner in the early days of his recovery, they are afraid of good, wholesome food. It is depressing to see such great staples as Bar Iron, Nails and Wire of all kinds as low as they are to-day, when everything except possibly the condition of foreign markets seems so ripe for a legitimate advance. A slight upward movement initiated in the articles mentioned would have a tonic influence all along the line, and we hope soon to be able to note it. Of course drought, floods, the cotton worm and various other ills that crops are heir to get in their work here and there over the country, but the evidences are that there will be enough to go around, after all. Enormous yields have not always proved beneficial, and it would seem as though there was possible in the case of agricultural product once in a while too much of a good thing.

Bar Iron.—There is a first-rate demand for Bar Iron. Mills are slow in filling assorted orders. They say that all their specifications call for immediate delivery, but that so far no one is buying for the future. As soon as such a movement does set in they will be justified in asking a good, round advance.

Sheet Iron.—All gauges of Sheet are somewhat firmer. The advance could hardly be called, however, more than $1 ₱ ton. The season for Light Sheet is just opening, and both common and better grades are in good request. There is apparently more Galvanized and Kalameined Sheet than usual this season going into consumption.

Steel.—There is a good demand for Tool Steel of high grade. So much so-called Cast Steel has been put upon the market of late years that the recognized extra and special grades are being more and more called for.

Nails.—There is a widespread inquiry for Nails, as prices have reached low-water mark once again—low enough, indeed, to tempt speculation. Wheeling mills say that under this stimulus their Nails are again flowing eastward. They rely on that section to take their surplus. This is only a fair return, as during the strike in the West Eastern mills have been large sources of supply.

Wire—Like the other great staples, is selling freely enough. The demand for 3-inch or Hog Barbed is specially heavy, and the factories seem behind. Here again it is odd enough at the hight of the season that there is no strengthening in prices. Plain Wire, too, is extremely low, but here again assorted orders are not filled with promptness, and we have just received notice from one large mill, up to now a free seller, that its prices are altogether withdrawn.

A special dispatch from Keokuk, Iowa, August 20, says: "The Missouri, Iowa and Nebraska Railroad was sold here yesterday by Master in Chancery Lomax. The road was sold in two portions. The first, from Keokuk to Humeston, was bought for $500,000 by T. Dewitt Cuyler, of Philadelphia, his being the first and only bid. The other portion, that part of the road extending from Humeston to Van Wert, was also bought by Mr. Cuyler, his being the only bid, and the amount being $100,000. Mr. Cuyler tendered the money and stated that he had purchased the road in the interest of the bondholders."

A bridge of wood and iron, 200 feet in length, at Brattleboro, Vt., built by C. E. Danforth & Co., of New York, broke down under an excessive strain and several persons were killed or injured.

Trade Report.

New York.

American Pig.—The market continues more quiet than was generally expected at this period. It is true that in some cases a larger part of the small orders for current or immediate requirements are being entered, but the fact remains that none of the business for future delivery which usually begins to make its appearance at this time has as yet come into the market. It is true that probably much of this was anticipated by the heavy contracts made early in this year. The market is practically bare of the best brands of Nos. 1 and 2 Foundry, whatever pressure to sell there is being confined to lower-grade brands. The Southern furnaces claim to have advanced their prices 50¢ a ton, and may be considered practically out of the market. It is a matter of which some consumers sharply complain that the furnacemen of that section seem to be rather irregular in the manner in which they make their shipments in this direction. A slight advance obtained elsewhere diverts the Iron from these markets and causes inconvenience to founders who have just become accustomed to running on a certain mixture. Forge Irons are very quiet and practically constitute the great bulk of all the Pig Iron carried by the furnaces. We quote standard brands Foundry No. 1, $18 @ $18.50; No. 2, $17 @ $17.50, and Gray Forge, $15.75 @ $16.25.

Scotch Pig.—Only small quantities are called for, and the majority of importers only do business on orders for shipment. We quote nominally as follows for small lots: Coltness, $19.75 @ $20 to arrive; Gartsherrie, $19 @ $19.25 to arrive; Shotts and Langloan, $19.50 @ $20 to arrive; Carnbroe and Glengarnock, $18.50 @ $19 to arrive; Summerlee, $19.25 @ $19.50 to arrive; Dalmellington, $18.50 @ $18.75 to arrive; Eglinton, $17.50 @ $18 to arrive, and Clyde, $18.50 @ $19 to arrive.

Bessemer Pig.—We do not hear of any transactions either in Domestic or in Foreign, and continue to quote nominally $18 @ $18.25 at furnace for the former, and $19 at tidewater for the latter.

Spiegeleisen.—Only one sale of a moderate-sized lot of a higher grade is reported. The majority of buyers are well supplied for the near future, and there are few inquiries in the market. We continue to quote English Spiegeleisen, 20 %, nominally $25.25 @ $25.50.

Bar Iron.—The probability that the majority of country mills will be forced to follow the example of the Philadelphia mills in advancing the puddlers' wages to a $4 base causes a number of them to demand a corresponding advance in the price of Bar Iron. The next few days will decide whether such an advance can be secured. If not, some of the mills seem disposed to voluntarily reduce output, claiming that current prices will not warrant the payment of higher rates of wages. We continue to quote for delivery on dock for round lots as follows, concessions being very difficult to obtain: Common Iron, 1.65¢ @ 1.70¢; Medium, 1.70¢ @ 1.75¢, and Refined Iron, 1.75¢ @ 1.9¢. Store prices are 1.75¢ @ 1.80¢ for Common, 1.85¢ @ 1.90¢ for Medium, and 1.9¢ @ 2.2¢ for Refined.

Structural Iron and Steel.—The week has been a very quiet one, and, if anything, there is a little less buoyancy than there has been of late. We quote for Angles 1 95¢ @ 2.10¢, delivered, and Tees at 2.35¢ @ 2.45¢ for round lots. Steel Angles are quoted 2.35¢ @ 2.45¢, according to quality. Store quotations remain 2.25¢ @ 2.4¢ for Angles, and 2.6¢ @ 2.7¢ for Tees. American Beams and Channels are nominally 3¢ base from dock for all orders.

Plates.—The market is steady here, with a fair amount of business, the bulk of the trade going to the mills coming from other sections, however. We quote for round lots: Common or Tank, 2.10¢ @ 2.20¢; Refined, 2¼¢ @ 2¾¢; Shell, 2.4¢ @ 2½¢; Flange, 3.25¢ @ 3½¢; Flange, Extra, 4¢ @ 4¼¢. For small lots of Steel Plates the quotations are as follows: Tank, 2.70¢ @ 2.75¢; Ship, 3¢; Shell, 3¼¢; Flange, 3½¢, and Fire-Box, 4¢ @ 4½¢, on dock.

Merchant Steel.—We quote nominally for the range of ordinary to good grades as follows: American Tool Steels, 7½¢ @ 9¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; English Tool, 13¢ @ 15½¢; common grades, 7¢ @ 9¢; Crucible Machinery, 3.75¢ @ 4.50¢. The Steel Association quotes base prices: Round and Flat Spring, 2.6¢; Round-Edge Tire, 2.3¢; Square-Edge Tire, 2.5¢; Toe Calk, 2.4; Sleigh Shoe, 2.2¢ @ 2.5¢; Open-Hearth Machinery, 2.5¢, and Bessemer Machinery, 2.5¢.

Steel Billets.—We do not hear of any new business, nor have, so far as we can learn, some of the contracts spoken of in recent issues been placed for Western delivery. Offerings, however, remain low.

Steel Wire Rods.—Very little business has been done during the past week, and small lots can be obtained for early delivery only by the payment of higher prices than those ruling heretofore. The bulk of the season's business has been done, and steamer shipments alone can be relied upon for sufficiently early delivery to land here in time for canal shipments to interior points. We quote nominally $37 @ $37.50.

Steel Rail Blooms.—There is considerable talk of new business, but it appears that purchasers often expect to place their orders for Blooms contingent upon the sale of Rails, which is difficult to manage for outside parties. The bulk of the Rail Blooms bought thus far have been taken by Steel Rail mills to fill up gaps in their Steel-making capacity if it is below their rolling capacity. We hear of a sale of 5000 tons of Rail Blooms for delivery at St. Louis at, it is rumored, $29 there. There are reports also of a sale of 5000 tons to a Pennsylvania mill, and it is stated that further business aggregating 10,000 tons is now pending. We quote nominally $24.50 @ $25.

Steel Rails.—Only small lots for November and December delivery have been placed during the week at $34 at mill, which is the ruling quotation. As yet little business has been done for 1887 delivery. It is known, however, that three Western lines are in the market for an aggregate of 35,000 tons, 1887 delivery. The question as to how this business will be placed is a somewhat puzzling one. On the one hand, the prospects for the demand for Rails next year, so far as it can now be gauged, is an excellent one, and it would seem from present indications that there should be no difficulty in securing current prices for such work. On the other hand, it is well known that many of the mills are fairly eager to book a moderate proportion of their capacity at an early date, trusting to the demand at a later time to call for their entire make. We do not hear of any further transactions in Foreign Rails, and quote American Rails at mill $34 @ $34.50, fall delivery, in moderate sized lots.

Old Rails.—With the exception of a lot of a few hundred tons of Street Rails at $20.50, on cars Jersey City, we hear of no additional business. The situation is one which it is somewhat difficult to accurately describe. There is some demand for immediate delivery on the part of a number of mills both East and West, and holders of available lots are asking considerably higher prices. We cannot ascertain, however, that this urgent demand is in the aggregate very large. On the other hand, considerable quantities of Old Rails are offered for later delivery, one concern alone having had during the last 10 days offers of nearly 30,000 tons from different parts of the country. Foreign mills are available for early shipment at $20 for Flanges and a little more for Double Heads, and that would appear to temporarily mark the highest notch. We quote $20 @ $20.50, according to size of order and time of delivery. It should be observed also that Mill Pig Irons are in somewhat abundant supply at the present time and are relatively lower, which may lead to some diversion in favor of the latter.

Scrap Iron.—The market remains featureless, with the bulk of the Domestic Scrap in yard being held at prices considerably above the market, while Foreign, of which there is a considerable quantity in store, cannot be imported at current prices.

Rail Fastenings.—We quote nominally 2.40¢ for Spikes, delivered, and 1.80¢ @ 2¢ for Angle Fish Bars. A meeting of the Spike Association is being held in this city to-day.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., Philadelphia, August 24, 1886.

Pig Iron.—There is no change of any importance, so that the report of last week would be equally applicable to-day. It is also difficult to find anything in the outlook to indicate with any degree of certainty what the developments will be in the near future. Every one is trying to find something to help them to a decision, but the mystery is as great as ever. The majority have settled down to the conviction that there will not be any change of importance this year, certainly not in a downward direction, while the continuous drumming up that they get makes them think that there need be no fears of scarcity. Probably this theory is correct and will continue to be acted upon until there is something of a more definite character than can be found at present. There are a few leading facts, however, upon which there can be no difference of opinion—large production, large consumption, light stocks, low prices. Ordinarily this would be taken as a certain indication of a start toward higher prices. It must be considered, first, that production has increased enormously within the past five or six years, and there is no reason to suppose that consumption will outrun this increase; and, next, that any advance in price, no matter how small it may be, brings supplies either from foreign markets or from others in our own country. And furthermore the demand is not of that urgent character that points to a still further widening of the demand. We are not prepared to say that the maximum has been reached, but the recent showing up in the demand shows that buyers are in a position to wait, which would not be the case if they were flooded with work and out of stock. The conclusion therefore seems to be that the time has not come for an advance in prices, and that those who can place their product at current rates will be willing to do so until something more favorable turns up. It may be remarked that, while supply and demand are very evenly balanced, the excess is not so evenly distributed. There is too much of some kinds of Iron and not enough of others, leading some to say they cannot get enough while others say they try their best and still fail to find a market. Taking a broad view of the matter it may be said that there is a healthy demand at steady prices, and that prospects are extremely satisfactory. Prospects may not change, but there will be plenty of business. Sales during the week have not been large, neither buyers nor sellers being very urgent about it, so that transactions have been chiefly in small lots at about $18.50 @ $19 at tide for Standard No. 1 Foundry, $19.50 @ $20 for choice brands, and occasionally $18 for good outside brands; $16.75 @ $17.25 for No. 2 Foundry, and $15.75 @ $16.25 for Mill Irons. In some cases slightly lower figures have been named, either because of favorable rates of freight or other circumstances desirable from a seller's point of view. Southern Irons are practically out of the market, and are not offered at any figures likely to attract the attention of buyers.

Foreign Iron.—Nothing doing, and no inquiry, so far as can be gathered in this neighborhood. Bessemer is quoted at from $19 to $19.50, c.i.f.; 20 % Speigel, $25 @ $25.50, and 10 % to 12 %, $22. No recent transactions.

Blooms.—There is considerable interest shown in quotations of Foreign Steel Blooms, with offers to sell 7 x 7 to 9 x 9 at $24.75 @ $25 25, c.i.f; Slabs for Nail Plate, $28 @ $30; Sheet-Iron Billets, $29 @ $30; higher qualities for Boiler Plate, &c., $36 @ $38; Charcoal Blooms, $50 @ $52; Run out Anthracite, $43 @ $44; Scrap Blooms, $34 @ $35, and Ore Blooms, $34 @ $35.

Muck Bars.—There is a fair demand for small lots, but bids for more than 100 or 200 ton lots are not easily obtained unless at low figures. Sales reported chiefly at $28 @ $28.50 at mill.

Bar Iron.—There is a pretty good demand, but prices do not respond as was expected. Business is plenty at about 1.8¢ for Best Refined Bars, but at anything beyond that it is very difficult to get orders except for small lots. There is plenty of business to be had, but when anything like remunerative prices are insisted upon the order is quite likely to go elsewhere. An advance of about $\frac{1}{10}$¢ has been obtained, but from present appearances that is as far as the market will go for the present. Skelp Iron is still wanted at 1.85¢, delivered, for small and 1.95¢ for large sizes, but sellers demand a tenth advance and will probably stand out for it, as they are pretty well supplied with orders for some weeks to come.

Plate and Tank Iron.—There is not much to report this week, for the reason that mills have nothing to offer, having sold all they can turn out for some weeks to come. Orders for small lots are squeezed in once in a while, but more as a favor than anything else. Prices are firm, but are still quoted at about the following figures: Ordinary Plate, 2.05¢ @ 2.1¢, delivered; Tank, 2.1¢ @ 2.2¢; Shell, 2.5¢; Flange, 3.5¢; Fire-Box, 4.25¢; Steel Plates, Shell, 3.25¢; Flange, 3.5¢; Fire-Box, 4½¢ @ 5¢.

Structural Iron.—There is nothing to report this week beyond the usual inquiries and sales of small lots. A great many orders have been taken within the past month or six weeks, and specifications are going forward pretty lively, giving the mills all the work they can do for some time to come. There is a firmer feeling in prices, but quotations remain about as follows: 2¢ @ 2.1¢, delivered, for Angles; 2.15¢ @ 2.25¢ for Bridge Plate; 2.5¢ @ 2.6¢ for Tees, and 3¢ for Beams and Channels.

Sheet Iron.—Light Sheets are not as active as could be desired, but other kinds are in great demand and give the mills all they can do to make deliveries as rapidly as required. Prices are irregular, but on the whole very firm at about last week's rates, viz:

Best Refined, Nos. 26, 27 and 28	3¼¢
Best Refined, Nos. 18 to 25	3¼¢
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28	4¼ @ 5 ¢
Best Bloom Sheets, Nos. 22 to 25	4¼ @ 4½¢
Best Bloom Sheets, Nos. 16 to 21	3¾ @ 4 ¢
Blue Annealed	2.6 @ 2.75¢
Best Bloom, Galvanized, discount	60 %
Common, discount	65 %

Steel Rails.—The demand for quick delivery is somewhat active, but for later dates there is less disposition to place orders, in the belief that prices are not going any higher. The mills have plenty of work and are taking some orders almost daily at from $34.50 to $35 at mill, but quote somewhat lower on later deliveries. There is not the slightest sign of weakness, however, neither is there likely to be any falling off in the demand, except of a temporary character, and in the meantime mills have all the work they can handle. Sales of Foreign Rails are reported at £3.10/, f.o.b. British port, or $37.50 @ $38.50, c.i.f. Gulf or Pacific ports.

Old Rails.—There is more inquiry and sales in considerable quantities at steadily advancing prices. Spot lots are scarce, with plenty of bids at about $20.50, f.o.b. cars, but the only sale within the past four or five days was a lot of nearly 1000 tons at $21.50, f.o.b. Philadelphia.

Scrap Iron.—The feeling is improving, and with a better demand an average advance of about 50¢ ₱ ton has been obtained on good No. 1 Scrap. General quotations about as follows: No. 1 Wrought Scrap, $18.50; Selected do., $19.50 @ $20; No. 2 do., $13 @ $14; Turnings, $14 @ $14.50; Old Car Wheels, $15 @ $16; Old Steel Rails, $20 @ $21; Fish Plates in demand at $23.50 @ $24; Cast Scrap, $14 @ $15; do. Turnings, $10 @ $10.50.

Wrought-Iron Pipe.—This branch of trade is in a healthy and satisfactory condition. Orders continue to be numerous, while prices are held very firm. A slight advance is in order and may be expected in a short time. There is no change to report in discounts, being the same as last reported, viz.: Lap-Welded Black, 57½ %; Butt-Welded Black, 42½ %; Butt-Welded Galvanized, 32½ %; Lap-Welded Galvanized, 40 %; Boiler Tubes, 52½ %.

Nails.—There is no change of any consequence to note, the condition of the Nail market being essentially the same as reported last week. There is but little doing, while prices are maintained with great firmness. Several mills which have been closed for some time past do not appear to be in any great hurry about starting up, claiming there is little or no margin at present price, and the only incentive would be an advance in price. Quotations during the past week have been $2.20, firm, for lots from store, while carload lots are firmly maintained at $2.10.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Avenue, Pittsburgh, Pa., August 24, 1886.

There has been no important change in general business during the past week. Manufacturers generally report an improved demand; orders are coming forward more freely, but competition is active and cutting of prices is still too common. Scarcely any of the leading articles of Iron and Steel command a fair margin of profit, and this is also the case in regard to some of the leading specialties, the production of which has been largely increased. Steel continues to supplant Iron for many purposes, and one of the results is that there is less work for puddlers. We hear of a number being out of employment, and some have left here and gone elsewhere. While the change from Steel to Iron in most instances is giving satisfaction, in some cases it does not. Steel shafts were supposed to be best for steamboats, but so many of them have broken of late that steamboat owners are going back to Iron again, having arrived at the conclusion that an Iron shaft is stronger and will wear longer. Quite a number of Steel shafts were made by Krupp, of Germany, for our large towboats, but several of these have also broken, and it is pretty certain that no more orders will go to Germany for Steel shafts. For steam boilers Steel has almost entirely supplanted Iron; orders for Iron boilers are now the exception. Structural Steel is now getting quite common, some of the mills making it a specialty. The new Wrought-Iron Pipe Works at Soho, owned by Moorhead & Co. and Lindsay & McCutcheon, of this city, and Crane Bros., of Chicago, have been in operation for some weeks, although the mill is not yet completed. Crane Bros., of Chicago, who will represent the new mill at the West, are taking about all the Pipe the mill can make. The Pipe mill of George Matheson and others at Newcastle, Pa., is about ready to start up. The Pipe mills not only here but throughout the country have had all they could do now for some years past, and it is not strange, therefore, that new mills are being erected and the production largely increased. The natural-gas companies are all busy laying Pipe; the Philadelphia company alone are said to have over 300 miles of Pipe laid in the ground.

Pig Iron.—There is no abatement in the demand, which has been quite active for some weeks past, and, while a firmer feeling obtains, prices remain unchanged. Consumers are buying freely; some of them are disposed to anticipate future events, while furnacemen, many of whom are sold close up, and from 20 to 60 days ahead, are indifferent about making additional contracts at present prices, especially for future delivery. We can report sales of Gray Forge Neutral at $15 @ $15.50, cash, and Bessemer Iron at $17.50 @ $17.75, cash, with some small lots at $18, cash. So far as we can learn there has been but one sale made at $17.50, cash, a lot of 2000 tons. Foundry Irons continue dull, but an improved demand is expected later on in the season. We repeat former quotations:

Neutral Gray Forge	$15.50 @	$16.00	4 mos.
All-Ore Mill	16.50 @	17.00, 4	"
White and Mottled	14.50 @	15.00, 4	"
No. 1 Foundry	17.50 @	18.00, 4	"
No. 2 Foundry	16.50 @	17.00, 4	"
All-Ore Foundry	18.50 @	19.00, 4	"
Charcoal Foundry	20.00 @	23.00, 4	"
Cold Blast Charcoal	24.00 @	27.00, 4	"
Bessemer Iron	18.00 @	18.25, 4	"

There has been less said about Southern Iron during the past week or two, and it begins to look as if our home furnacemen were more scared than hurt, although there is no disputing the fact that a good deal of Southern Iron has been sold in this market of late, but in order to effect sales it had to be sold considerably below the price of home-made Iron.

Muck Bar.—There is more inquiry and the market is firmer, owing in part, it is said, to the enhanced price of Old Rails. We continue to quote at $27 @ $27.50, cash, although some of the mills are refusing to accept less than $28, cash.

Manufactured Iron.—There is a continued good demand. The mills have about all they can do, and the indications are that this will continue to be the case until the close of the present year. In addition to the regular merchant trade the railroads are buying liberally. The latter are building a great many new cars and locomotives, all of which require a good deal of Iron. So far as the mill owners are concerned the Iron trade is in better condition than it has been for some time, for while the raw material is lower than it was some months ago the products are bringing about the same prices. In addition to the regular Merchant Iron trade there is a very good demand for specialties. Some of the mills have been working almost exclusively on Pipe Iron since early in the spring. We continue to quote prices on a basis of 1.65¢ @ 1.70¢ for first quality Bars and well-assorted orders.

Nails.—The situation remains substantially the same as noted in our last report; business is only fair, but it would be increased a good deal if our manufacturers were disposed to meet prices being accepted elsewhere. We continue to quote at $1.90, 60 days 2 % off for cash, in carlots and upward, for Iron, and 10¢ @ 15¢ additional for Steel. There is very little margin at prices quoted, and while this is the case there is no room to cut. Zug & Co. have not started their factory up yet, nor will they be in any hurry in doing so while the market remains in its present condition.

Wrought-Iron Pipe.—There is no abatement in the demand; mills are all as busy as they can be; prices steady as quoted. Discounts on Black Butt-Welded Pipe in carlots and upward, 45 %; Galvanized do., 35 %; Black Lap-Welded, 60 %; Galvanized, 42½ %; Boiler Tubes, 52½ % off; 2-inch Oil Well Tubing, 14¢, net; 5⅝-inch Casing, 45¢ ₱ foot; 8-inch Drive-Pipe, $1.30.

Old Rails—The offerings of Old Iron Rails continue light, and with some inquiry, especially for immediate delivery, prices are still tending upward. We now quote at $23 @ $23.50, although it is doubtful whether any large lots could be sold at prices quoted. Old Steel Rails also scarce; Long Lengths may be quoted at $22.50 @ $23; sale of 600 tons at $22.50.

Steel.—There is continued activity; mills as a rule are pretty well employed, but there is still a good deal of complaint in regard to prices. Standard brands Refined Cast Tool Steel, 8¢ @ 9¢; Crucible Machinery, 3¾¢ @ 4¢; Open-Hearth do., 2½¢; Bessemer Blooms and Billets, $30 @ $31; Nail Slabs, $29 @ $30.

Railway Track Supplies.—Spikes remain unchanged at 2.40¢, 30 days, Splice Bars, 1.65¢ @ 1.75¢; Track Bolts, 2.75¢ with Square and 2.85¢ @ 3¢ with Hexagon Nuts.

Old Material.—There is a fair business at unchanged prices. Sales of No. 1 Wrought Scrap at $17.50 @ $18.50, net ton; Wrought Turnings, $13 @ $14; Old Car Axles, $23 @ $24; Cast Borings, $12 @ $12.50, gross ton; Old Car Wheels $16; Open-Hearth Steel mixed lots, $19 @ $20.

Chicago.

Office of *The Iron Age*, 36 and 38 Clark St., Cor. Lake St., Chicago, August 23, 1886.

The business situation is steadily becoming better. In every branch of trade merchants comment on their fair prospects. In volume sales are said to be in excess of the usual August trading. The lowest prices are disappearing; transactions are made on smaller concessions, and buyers are doing less shopping and less objecting to the small advances asked. These encouraging features are supposed to come from the general revival of business throughout the West. The quantity of idle labor is much less than some time ago, and employers must consequently pay better wages. This increases the cost of raw material and finished goods, thus establishing the basis of higher prices at the very bottom. Factories in nearly all lines of Iron goods are more fully employed at the present time than at the same period for several years past; Western foundries are all full of work; new furnaces are being erected and old ones repaired and relighted. In the business world these features are cited as indicative of an era of prosperity. No great advance in prices is expected, but the common impression prevails that the markets will be firm; that there will be less deviation from price lists, which will afford a greater margin of profit on fall sales.

Hardware.—Business i picking up very rapidly, and the increase in demand for Shelf Hardware, Window Glass, Coal Hods, Stove Boards, Elbows and the like is quite noticeable. In Heavy Hardware the same conditions are noted. Carriage Bolts, Chains, heavy Tools, such as Spades, Shovels, Scoop Shovels, Picks, Wheelbarrows, Measures, Sieves, Coal Screens, &c., are in unusual request for this season of the year. In every class of goods jobbers and makers are asking a little advance. Prices which have been so very low are being gradually withdrawn, and the prospect of a uniformly higher market is favorable.

Barb Wire.—This branch of trade seems to be an outside issue and is the weakest and most irregular line of goods handled by jobbers. They, in fact, pay little or no attention to it, as any one of the makers would undersell them on an order of any importance. For small lots with other goods jobbers quote about 3¼¢ for Painted and 4¢ for Galvanized. In larger lots makers shade these figures to 3¢ for Painted and 3¼¢ for Galvanized in open market. The unsettled condition of the market offers no inducement to buyers, and sales are said to be

very light. Some makers who still think they will at some future day get their pool completed are holding on to their stock. Those who have lost faith in combinations are selling at the best price they can get, and preparing to meet the market under all circumstances.

Nails.—Street gossip is responsible for the rumor that Nails were sold at 5¢ ℔ keg below quotations. Jobbers quote, from store, Iron Nails at $2.10 and Steel at $2.20, and if this price has been cut both buyer and seller are as yet unknown. Carloads are quoted at 5¢ ℔ keg off, with the additional 2 %, 60 days, at discretion. Even though Nails have been sold at less than the regular price it would not necessarily mean that the market is weakening. There are jobbers who still have the tail end of Eastern stocks on hand that they would gladly close out at a discount on the regular price for the sake of getting rid of them. Consumers will not take them at the same price they pay for Western Nails, and the only way left will be to sell them for less money. Western makers are asking $2, Chicago delivery, for Iron and $2.10 for Steel. The demand from all classes of buyers is said to be very good.

American Pig Iron.—While the market is less active, it has not suffered any in tone. The tonnage for the week was made up principally from small lots, on which better prices were obtained than prevailed a month ago. Furnacemen are not inclined to force sales at the moment, and buyers are apparently waiting for further inducement. Many of the Charcoal-Iron makers are holding at a slight advance on July prices. The most desirable brands are pretty well sold up for the next six months, and on other grades buyers are not rushing to place their orders. There are plenty of buyers who would place orders at present prices if they could get the brand of Iron they want in large lots, because they cannot they buy in smaller quantity and wait for a change in the situation. It will require a very great improvement in all lines of manufacture to affect the Pig-Iron market to any extent, so that buyers are comparatively safe. In the meantime stocks will increase on some grades and still afford buyers the same relief that they now have in case the market goes against them. The new Irons that are now being introduced also operate against better prices. They are offered under the regular market price as "sample lots," and, if the quality proves satisfactory, there is no doubt but what the respective furnaces will be willing to duplicate the order two or three times. If they do not prove satisfactory they will need to be sold at a still lower price to save the furnace plant from bankruptcy. On present business all good brands are held firm at fully 25¢ ℔ ton above the prices made two weeks ago on round lots. The carload price has not been changed. On Lake Superior Charcoal Iron we quote $19.50 @ $20, four months, for standard brands. Coke Irons are more regular in prices made on large quantities, and have been sold all the time since June 1st at less variance in price. In carload lots sales are made at $19 @ $19.50, with no inclination to shade the lower figure on the best brands for any quantity. Cinder Mixed are still quoted at $18, and $19 @ $20.50 named as the market price for Ohio Standard Blackbands. Southern Irons are dull of sale since the attempt to get higher prices on the leading brands. There are quite a number of Irons that can be substituted for them, and whenever the price is above or equal to the figures for Hanging Rock the latter is given the preference. The asking price for Southern No. 1 Foundry is $17 50; No. 2, $16.50 @ 17; No. 3, $15.75, cash. It is not likely that many large sales can be made at these figures until there is an advance all along the line. Buyers would rather pay more for a better Iron and get it nearer home in carlots as they need it.

Merchant Steel.—In fine grades of Steel business was tolerably good last week. In cheap Steels there is no improvement to notice either in demand or price. Notwithstanding that jobbers make such a discouraging report, the mills are reported full of work and new ones about starting. In Fine Tool and Machinery Steels, known as specials, the market is regular and quoted firm at list price. Ordinary grades of Tool Steel are quoted at 7½¢, and standard grades at 8¢ @ 8½¢; no changes in other quotations.

Steel Rails.—Local mills report that they have more work than they can turn out. Orders are still coming in for fall delivery, and some inquiry for next spring delivery. It is not likely that many transactions have been completed for 1887. On this year's business $38 is the price named.

Structural Iron.—Nothing of importance in the way of new buildings. Beams and Channels are in good demand from yard. In Bridge Irons there is more activity. The contract for a new bridge and viaduct at Twelfth street, this city, was let last week to the Chicago Forge and Bolt Works. There are two other city bridges that will be placed under contract very soon. Considerable Iron of various kinds will be wanted for the construction of the North Side Cable Road and Engine building. Mills are all well employed and asking high figures for Splice Bars, Track Bolts and Spikes. We quote as follows: Beams and Channels, combination price, 3.10¢; store price, 3.50¢; Angle Iron, 2.40¢; T Iron, 3¢; Flitch Plates, 2½¢ @ 2¾¢.

Bar Iron.—The demand for Merchant Bars is reported very good. Makers of Best Refined New Puddled Ore are having the cream of the trade at a slight advance over prices made 30 days ago. Quotations on this quality are 1.85¢ @ 1.90¢ from store and 1.70¢ from mill. No orders are accepted for future delivery unless accompanied by specifications. Large order have been placed at these figures recently for immediate shipment. On Common Iron, Old Rail Stock, store price is quoted at 1.75¢ rates in small lots and 1.65¢ rates in carloads. From mill the price has been 1.55¢ rates, but the sudden rise in old material renders sales at this figure impossible, according to makers' statements.

Galvanized Iron.—The favorable conditions of this market were further confirmed last week. A great many small buildings are approaching completion, and cornice-work is taking a good deal of Iron. Jobbers are having a better demand from the country, and makers are doing better with the Heater trade. Prices are gradually gaining strength, and it is believed that the very low figures on cheap grades have given the makers all they want. Jobbers quote Juniata at 60 and 5 % off and Charcoal at 60, 10 and 5 % off from store.

Black Sheets.—There is quite an improvement in the demand for Black Sheets, especially in low-grade quality. Jobbers have advanced their prices from store as follows: No. 24, 2.90¢; Nos. 25 and 26, 3¢; No, 27, 3 10¢. The best quality is quoted ⅒¢ higher.

Plate and Tank Iron.—Trade is again picking up, and small orders are placed at a little advance on prices current some weeks ago. The North Side Cable Company are in the market for 11,000 Steel Plates, weighing 200 lb each, bent to shape for constructing the cable trough of the new road. Several other lots of less note are mentioned. Quotations from store remain as last given.

Old Rails.—A great many of the mills want Rails, but they say they cannot pay the price. Railroads are asking $23, and do not care to sell at that. Consumers are quoting $21, Chicago delivery, but sales are reported at $22, and it is doubted whether Iron Rails can be bought for less. Old Steel Rails have been sold at $19 in 100-ton lots, mixed lengths.

Old Wheels.—There is less inquiry for Wheels. Prices remain firm at $15.50 @ $16 in round lots and $16.50 in carloads.

Scrap Iron.—Dealers are holding all grades of Old Material a trifle above what consumers are willing to pay. The demand for Wrought is very great at 50¢ @ $1 ℔ ton below these prices. Sellers quote No. 1 at $18; No. 1 Mill, $14.50, and No. 2, $9.50. Cast Scrap, $13.50 @ $14, net ton.

Pig Lead.—The market has been quiet for several weeks. Sales made were on a basis of 4.65¢, spot delivery, and aggregate some 300 tons for the week.

Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts., CHATTANOOGA, August 23, 1886.

There is nothing of special importance to note in the way of business movements. As the fall approaches merchants are experiencing an increase in the demand for almost all kinds of plantation goods, and the present outlook is very good for a healthy trade during the remainder of the year. The amount of building that is going on through the South has stimulated many industries, and the result is the establishment of a number of small works for the manufacture of Locks, Hinges and other articles of like character that enter largely into the erection of new buildings. It is too early to pass an opinion as to the prospects of the cotton yield, but, so far as indications now go, there will be a fair yield of the staple crops. Money matters seem to be more evenly divided through the South than ever before, and where business firms appear to be on a settled basis discounts are to be had at 8 @ 10 % per annum. The question of labor has as yet entered very little into the calculations of manufacturers. With one or two exceptions this matter has not been a disturbing element with them, and, so far as can now be seen, it is not likely to interfere materially with any of the manufacturers of the South.

Pig Iron.—The demand continues fully up to the capacity of the furnaces, and the consequence is that no stocks are accumulating, and contracts are being made ahead as far as the owners dare to go. The consequence is that prices are stiff, and when large orders are offered it is seldom that any concession is asked for from ruling prices, and even at those figures furnaces have declined some large orders. Prices of Southern Irons are no doubt somewhat stimulated by the knowledge that nearly all of the Northern mills are full of orders for some months to come, and many of them are offering contracts for Pig to run through the next six months. Should this condition of affairs continue through the coming year it is thought by most of the furnace owners that prices will naturally advance.

Miscellaneous.—The manipulation of Southern fruits and vegetables into canned goods is likely to become a very important item in Southern industries in the near future. Within the past two or three years several experimental concerns were started which have resulted in decided financial successes, and from the present outlook the indications are that there will soon be a large number started up through the districts that have been turning their attention to the growing of vegetables and fruits. Two concerns that last year started in a small way are this year shipping their goods by the carload to Northern and Western points, and find a ready market for all they can make at remunerative prices. A knowledge of this has been an incentive to others, and the indications are now that several concerns will be ready to avail themselves of the crops of 1887.

Birmingham.

BIRMINGHAM, ALA., August 23, 1886.

Business is all that could be wished. Undoubtedly sales are larger, collections easier and the general drift of things better here now than ever before. Among the healthful influences to be seen on the surface is a considerable increase of the operations of railroad contractors, assurance of a variety of new enterprises and a steady influx of capital for investment in real estate or whatever else offers. The real estate boom has within the last few days raised prices away beyond the best figures ever realized before. The highest point was reached last Friday, an unimproved corner selling for $1000 ℔ foot, $300 ℔ foot above the highest previous sale. There has been a veritable scramble for desirable ground for manufactures or business houses. There is some little shade of discomfort, and this comes from the reputation of the Louisville and Nashville Railroad Company as a "scooper-up" of competition, which reputation is just now accentuated by its purchase of the Alabama, Indiana and Texas road, that was coming from Western Kentucky through Tennessee toward Sheffield. The controlling interest in this was owned by parties almost as largely interested in Sheffield, and a not unnatural consequence of the sale is a rumor that the Louisville and Nashville is also going to get the Sheffield and Birmingham road and stop it where it is, but there is really no very reasonable basis for such a notion, as the railroad and the town of Sheffield are in different hands. A reported dial of greater consequence to Birmingham is the L. and N.'s purchase of controlling stock of the Central of Georgia Company. It is believed that the chief incentive to this purchase has been the staying of the projected Goodwater extension to this city; anyhow, it would probably have this effect.

Pig Iron.—Manufacturers now report an advance of from 50¢ to $1, and the former is a safe advance to quote. Market prices, however, are only to be determined from offers and inquiries, as nobody is selling to any considerable extent. The furnace operators as a rule are demanding better than ruling prices for what little Iron they have to sell, and so are practically out of the market.

Finished Iron.—There is the slightest improvement in this line, so far as the tone of inquiries goes, and it seems more certain than ever that an advance of prices is near at hand. Buyers everywhere evidently recognize the probability of higher prices, even though their offers do not betray that they do.

Miscellaneous.—The foundries and shops furnish no news item—certainly no variation from the rule that has prevailed for months now of all the work they can do. One enterprise that has been promised for some time may be put down now as assured—Tool works, to be built by a man now in the same line in New York State. Ground is being cleared for the Baxter Stove Works, the Queen and Crescent Railroad shops, and a new foundry.

Cleveland.

August 23, 1886.

Pig Iron.—The increase in the number of inquiries and sales is marked. Prices are almost stationary, but business has been brisk. Dealers no longer complain of the quiet trade noticeable six weeks ago. Several of the large firms visited claimed that the August sales would be fully double those of July. Dealers believe that the present animated condition of the market will continue for several months. For Charcoal Iron $20 ℔ ton is quoted as an outside figure. For Bessemer Iron $17.70 would be an avorage quotation. The larger movement encourages dealers to hope for better prices within a very few weeks. Nos. 1 and 2 Lake Superior Charcoal Iron is still quoted at $20.50 @ $21.50; Nos. 2 and 3 at $21 @ $22, and Nos. 5 and 6 at $19 @ $20. It is insisted everywhere that these rates must advance at least 50¢ ℔ ton very quickly. In Bituminous and Coke Irons No. 1 Bessemer still stands at $18.70; No. 1 Foundry, all Lake Ores, at $18.50, and No. 1 Foundry, Lake Ores, with Cinder mixture, at $17.50 @ $18. Even a better advance is hoped for these brands than in the Bessemer Irons.

Iron Ore.—Lake rates continue to increase. The Escanaba rate to Ohio ports is now $1.15, and from Marquette $1.40 is demanded. The receipts last week were 25,260 tons, exclusive of the 21,180 tons shipped to inland cities. For the same week last year the receipts were 20,000 tons, and the shipments 14,800 tons. The shipment of Ores from the upper lakes to date is thus summed up: From Escanaba, 789,900 tons; St. Ignace, 36,900 tons; Marquette, 485,495 tons; Ashland, 335,356 tons; Two Harbors, 156,340 tons. The Ore market is very firm. Gogebic Ores took a leap of 25¢ ℔ ton upward last week, and other Ores promise to advance very soon. Sales are very frequent, and while no large transactions are reported the aggregate business is believed to be very large. The fear expressed by many consumers a few weeks ago that the market would be overstocked seems in no danger of realization. A leading dealer reports all grades of Ores well sold up. This fact, together with the advancing freight rate, has stiffened the market. Dealers are not ready to predict an actual shortage. The lively sales of the past few weeks have taken several mines out of the market. A significant feature of the trade is the fact that dealers are not anxious to sell, and are confident of better rates. No. 1 Specular and Magnetic Bessemer Ores are quoted at $6.25 ℔ ton; Non-Bessemer Ores, $5.50 ℔ ton; Bessemer Hematites, $4.75 @ $5.50; Non-Bessemer Hematites, $4 @ $4.75. Gogebic Ores are now quoted at $5.25, and Ores for mill use at $5 @ $6.25.

Old Rails.—The scarcity reported last week continues. Sellers say they could realize $23 ℔ ton had they the Rails to offer. Buyers are inclined to quote $22 or $22.50, but would likely pay the asking price.

Cincinnati.

August 23, 1886.

Pig Iron.—The local market has lost nothing with the waning of the month, but, on the contrary, furnaces have assumed greater confidence, and the orders which have been placed for Southern Iron have been at an advance of 25¢ @ 50¢ ℔ ton over the prices previously announced. The Ohio and Pennsylvania stacks have enjoyed a run of small orders, say from 50 to 100 tons, for present delivery, but contracts running from two to four months have also been made for various amounts ranging from 500 to 3000 tons. The accumulation of orders, which will absorb the product of a number of these latter furnaces for several months, imparts greater strength to the general situation, and, as the number of competing furnaces is reduced, those still in the market are given a better control, and an advance in the higher-priced metal is not improbable. Yet, with the experience of the past year before them, or, more correctly speaking, behind them—and recognizing the force of the old adage that "there's many a slip 'twixt the cup and the lip," the furnaces are disposed to pursue a conservative policy. Buyers are not slow to note the improvement in general business, and are encouraged to anticipate wants at the now prevailing rates, the chances for a depreciation of stock being few, while the tendency upward is favored by a combination of circumstances; yet it is not to their interest to make any special demonstration, and in many cases they are enabled to take advantage of the active competition which exists between the representatives of different furnaces. A good illustration of this potent principle has been exhibited during the past week. A large agricultural concern at Springfield placed this week an order for mixed Nos. 1, 2 and 3 Southern Pig and Bar Iron at $1 ℔ ton less than it was enabled to do last year; the order was of considerable magnitude, being the raw material required by the company for the entire year, probably 2000 to 3000 tons. Barring the active competition for the prize, this transaction would seem to indicate that the remarkable firmness for Southern Iron is more, if not entirely, upon the better qualities. It is almost impossible to place an order for Car-Wheel Iron for delivery this side of January, agents asserting that it is not a matter of price, but a question of supply. But while this is true as regards a majority of the furnaces making such Iron there are a few stocks still in the market for moderate amounts for late delivery. While Car-Wheel Pig is scarce and both Forge and Foundry Iron active, Bessemer Metal remains weak, but at the lower prices now current a more active demand has been experienced for the domestic product. One lot of 3000 tons was sold this week through a Cincinnati firm to Pittsburgh at $17.50 @ $17.75 ℔ ton there. The better transportation rates secured by this home house from the North to Pittsburgh direct enabled them to place the order. The same Iron laid down in Cincinnati would have cost $18 @ $18.25. Notwithstanding this discrimination Cincinnati shares the benefit with Pittsburgh. The placing of an order for 1200 to 1500 tons of mixed Southern, Hocking Valley and Plain Iron by another Springfield firm through a Cincinnati house has just been announced, the Iron to be delivered 200 to 300 tons every 60 days. The Pipe works in Covington have also been inquiring for Southern Coke Iron in this market during the week, the amount desired being 3000 to 4000 tons. Some interesting reports are current concerning the forces at work in the local market. If rumors are correct prices may be somewhat influenced thereby, but they are not fully developed; they may never reach maturity, and are therefore of little significance in an estimation of the present condition of the market. Notwithstanding so many furnaces are sold ahead and the prospects for the future are bright, and more remunerative prices are probable, there is no scarcity of Iron, generally speaking, nor is there likely to be an inadequate supply with the present rate of production. The Western market as a whole is in a healthful condition. Advices from the East are less encouraging. We quote for cash, f.o.b. cars at Cincinnati, as follows:

Charcoal Foundry.	
Hanging Rock, No. 1	$19.00 @ $21.00
Hanging Rock, No. 2	18.00 @ 20.00
Southern No. 1, 4 mos.	17.50 @ 18.50
Southern No. 2, 4 mos.	16.50 @ 17.50
Coal and Coke Foundry.	
Ohio Soft Stone Coal, No. 1	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2	15.50 @ 16.50
Southern Coke, No. 1	16.00 @ 17.00
Southern Coke, No. 2	15.00 @ 16.00
Southern Coke, No. 3	14.50 @ 15.50
Ohio and West Pennsylvania Coke, No. 1	18.00 @ 19.00
Ohio and West Pennsylvania Coke, No. 2	17.00 @ 18.00
Forge.	
Strong Neutral Coke	14.00 @ 15.00
Mottled	13.00 @ 13.50
Southern Coke, Cold Short	13.50 @ 14.00
Car-Wheel and Malleable Irons.	
Southern Car-Wheel	20.00 @ 23.00
Hanging Rock, Cold Blast	26.00 @ 27.00
Hanging Rock, Warm Blast	20.00 @ 21.50
Lake Superior and Malleable	22.00 @ 23.00

Bar and Sheet Iron.—The demand for Manufactured Bar and Sheet Iron has increased rather than diminished, and with a fuller resumption of industrial activity a further improvement may be anticipated. The mills have considered the advisability of an advance, but have decided to make no change for the present. Common Bar Iron, 1.65¢ @ 1.75¢; Charcoal Bar Iron, 2.65¢ @ 2.75¢; Sheet Iron, Boiled, Nos. 10 to 27, 2¼¢ @ 3¢; Sheet Iron, Charcoal, Nos. 15 to 25, 2½¢ @ 4¢ ℔ lb.

Old Rails.—There has been quite an active, even an urgent, demand during the week, and an advance of 50¢ has been offered. It is claimed that railroads have been holding this Scrap for an advance. If this be so they have been partially successful. Old Wheels have also ruled firmer under moderate offerings and a good demand.

Scrap.—For Rails we quote $21 @ $21.50, and for Wheels $17. @ $17.50.

St. Louis.

ROGERS, BROWN & CO., St. Louis, W. H. SHIELDS, manager, report, under date of August 23: The market is active, with inquiries from all quarters. All prices are firm, and some furnaces have advanced 50¢ @ 75¢ ℔ ton over selling price of two weeks. The Missouri charcoal furnaces are well sold up, and have practically no Irons to sell. Cast Scrap is very scarce, and the demand for low grades of Mill Iron is in consequence very active. Old Rails are scarce and show a material advance, while Old Wheels are quite plentiful, the demand being limited.

Charcoal Foundry.	
Missouri—None offering, nominally	$17.00 @ $18.00
Southern	17.50 @ 18.50
Coal and Coke Foundry.	
Southern, No. 1	16.75 @ 17.75
Southern, No. 2	16.00 @ 16.75
Ohio Softeners	17.00 @ 20.00
Mill Irons.	
Missouri	16.00 @ 16.50
Southern	14.50 @ 15.75
Car-Wheel and Malleable Irons.	
Southern	20.00 @ 25.00
Lake Superior	21.00 @ 23.00
Scrap, &c.	
Old Wheels	16.00 @ 16.50
Old Rails	20.50 @ 21.00
Connellsville Coke (Frick's)	@ 5.65

Imports.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending August 25, 1886:

Hardware.

Baldwin Chas. & Co.
Gun barrels, cs., 17
Berbecker & Co.
Nails, cs., 23
Boker Hermann & Co.
Cutlery, cs., 11
Chains, csks, 23
Curley J. & Bro.
Mdse., case, 1
Drexel, Morgan & Co.
Arms, cs., 4
Esberg, Bachmann & Co.
Cutlery, case, 1
Fuller Bros.
Mdse., cs., 3
Godfrey C. J.
Arms, cs., 3
Gerdan O.
Mdse., pkgs., 687
Guyon & Co.
Arms, cs., 10
Hartley & Graham,
Arms, cs., 2
Law J. H & Co.
Cutlery, cs., 3
Merch. Desp. Co.
Arms, cs., 21
Cases, 2
Chains, cks., 6
Moore's John P. Sons.
Arms, cs., 13
Schoverling, Daly & Gales,
Gun barrels, cs., 4
Arms, cs., 6
Sheldon G. W. & Co.
Cases, 6
Wiebusch & Hilger,
Mdse., cs., 10
Iron chains, csks, 26
Witte John G. & Bro.
Cutlery, cs., 10
Needles, case, 1
Order,
Cutlery, cs., 1

Iron.

Baring Bros. & Co.
Wire rods, coils, 6869
Bars, 2106
Coddington T. B. & Co.
Sheets, bdls., 733
Sheets, bxs., 40
Crocker Bros.
Ferro iron, tons, 418
Ferro iron, cks., 61
Spiegel, tons, 110¼
Downing R. F. & Co.
Girders, 242
Florey R. de.
Ore, tons, 577
Knauth, Nachod & Kuhne.
Mach'y, pkgs., 14
Miller, Scholl & Co.
Bars, 7448
Naylor & Co.
Bars, 3866
Coils, 1681
Underhill A. M. & Co.
Mach'y, pkgs., 3
Wilson & Willoughby.
Mach'y pkgs and pcs., 16
Order,
Pig, tons, 150
Spiegel, tons, 4803
Spiegel, lot, 1
Rods, bdls, 5467
Rivet wire rods, coils 516
Rolled iron, bdls., 311
Cotton ties, bdls., 2214
Bar, bdls., 400
Old iron, tons, 30

Steel.

Abbott Jere & Co.
Cases, 12
Baring Bros. & Co.
Billets, 4443
Cortis R. J.
Wire rope, coils, 4
Downing R. F & Co.
Slabs, 314
Heyn A.
Rods, pkgs., 253
Meissner, Ackerman & Co.
Wire, bdls., 606
Muller, Scholl & Co.
Rods, bdls., 817
Rods, pkgs, 868
Pilditch F. S.
Bundles, 106
Wetherill Bros
Bundles, 21
Order,
Slabs, 146
Rods, bdls., 11,555
Billet ends, tons, 49¾
Bars, 130
Crop ends, 235
Blooms, 213
Billets, 869
Bloom ends, tons, 236
Cylinders, 100
Tubes, cs., 5
Tubes, 75
Bundles, 28
Packages, 36

Metals.

Baring Bros. & Co.
Tin plates, bxs., 201
Bruce & Cook,
Tin plates, bxs., 695
Dickerson, Van Dusen & Co.
Tin plates, bxs., 1210
Echeverria M. & Co.
Old metal, bdl., 1
Old telephones, bx., 1
Order,
Lead, bars and pkgs., 3093
Tin plates, bxs., 2421
Spelter, plates, 2115
Tin, slabs, 4572
Tin plates and tin taggers, bxs., 814

Trade Report.

General Hardware.

Trade continues in fair volume and with steady prices. The orders in most cases are for assorted lots, and second orders from parties that purchased early in the season are frequently received, confirming advices that the stocks of goods in dealers' hands are light. There is no material change in the tone of the market as regard prices, which have not the strength that would have been expected with the volume of business doing. There seems to be something of a disposition on the part of both manufacturers and dealers to sell goods at a narrow margin of profit, and if both of these classes of sellers would follow a different policy the market would without doubt speedily show an improved condition. As it is, the indications point to a large fall trade.

BARB WIRE.

The New York market continues without any new features, there being a moderate demand for small lots. We quote 4 cents for carload lots, 4⅛ cents for 3-ton lots and 4⅜ cents for smaller lots of Four-Point Galvanized Barb Wire.

NAILS.

The New York market is quiet and steady, with only a small business being done to cover immediate requirements. Some sellers report a slight increase in the number of small orders during the last few days. We quote nominally $2.10 for carload lots of Iron Nails.

The Riverside Iron Works, of Wheeling, W. Va., under date of August 21, issue a circular in which they announce to the trade that the long strike of the nailers, which began June 1, 1885, has terminated. Their former workmen have concluded to accept the terms offered them and have taken the unoccupied machines in their factories. During the stoppage they have increased their facilities for making Nails by the addition of 80 new Nail machines, and they now have in their two factories 224 machines, being the largest number under one management in the country. They manufacture direct from the Ore all of the Pig Iron and Steel that they use.

MISCELLANEOUS PRICES.

The low prices ruling in Nails Wire, Barb Wire and some other leading lines are referred to as having some effect on prices of other goods, and preventing the market from having the tone and confidence that would otherwise characterize it.

The prices of Common Carriage Bolts are firmly maintained, and the market for Tire, Machine and other Bolts is firm, with a slight tendency toward higher prices. The manufacturers of Machine Bolts and Nuts have not thus far been able to come to any agreement in regard to uniformity of prices.

Wrought-Iron Butts are held firmly by the manufacturers at the prices agreed upon, but the market is given some irregularity from the fact that many of the leading jobbers who purchased largely at low prices are underselling the manufacturers, in some cases giving the small trade the manufacturers' extreme prices on small ots.

Strap and T Hinges are held firmly at association prices, small extras being given by some jobbers. It is reported that Lindsay & McCutcheon, Pittsburgh, Pa., are preparing to manufacture this line of goods, on which, however, they are not yet in the market.

Door Knobs are purchased very frequently at net figures, careful buyers finding that in this way they can mostly get somewhat better prices than are usually named in discounts from the list.

Since the first of the month the price of Padlocks has receded something like 5 per cent., but there is the usual divergence between the prices named by the leading manufacturers. Sargent & Co. are now in the market with a limited line of these goods.

Some of the smaller manufacturers of Wire Nails are offering the goods at lower figures than those named by some of the leading companies. A large demand is reported, but the capacity of the factories is probably greater than the requirements of the trade.

The prices of Iron Planes are irregular, and some concessions have recently been made. The large variety of these goods on the market contributes to this result, many new goods being offered, and usually at lower prices than those of recognized position.

The market for the general line of Wire continues irregular, without, however, any further concessions in price.

The price of Sash Weights from manufacturers in this vicinity is, as announced in our last issue, $22.50 per ton, but some outside makers make concessions from this price.

The manufacturers of Screws, who have recently had frequent conferences, meet again this week, and this time in the White Mountains. It is not anticipated that any important measures will be immediately consummated, but the fact that the manufacturers are thus conferring makes it not improbable that something in regard to the production or price of Screws may be determined upon before long. It may be added that some of the manufacturers are not parties to these conferences.

The Standard Company, 129 Portland street, Boston, Mass., announce the following reduced price list of Egg Beaters :

	Per gross.
Acme	$7.00
Kingston	7.50
Standard	10.00
Duplex	12.00
Rapid	15.00

They also issue a circular referring to the sale of Egg Beaters which infringe their patents, June 29, 1880; September 21, 1880; March 8, 1881; July 14, 1885, and calling attention to their extensive line of these goods and the low prices at which they are offered. It will be observed that among the Novelties on page 29 their latest Egg Beater is illustrated.

Yates & Co., Rockford, Ill., announce, August 10, the following reduced prices on their line of Stove Polish, Varnish, &c. :

Superior Liquid Stove Polish, 2-gallon cans, per gallon	$0.90
Superior Liquid Stove Polish, 3-gallon cans, per gallon	.80
Superior Liquid Stove Polish, 5-gallon cans, per gallon	.70
Superior Liquid Stove Polish, 10-gallon cans, per gallon	.60
Superior Liquid Stove Polish, half-pint bottles, per dozen	1.20
Nonpareil Stove Varnish, 5-gallon cans, per gallon	.50
Rust Proof Stove Varnish, 2-gallon cans, per gallon	.90
Rust Proof Stove Varnish, 3-gallon cans, per gallon	.80
Rust Proof Stove Varnish, 5-gallon cans, per gallon	.70
Rust Proof Stove Varnish, 10-gallon cans, per gallon	.60
Standard Paste Stove Polish, 10-pound cans, per pound	.15
Standard Paste Stove Polish, 50-pound cans, per pound	.14
Standard Paste Stove Polish, 100-pound cans, per pound	.13
Brightine (Nickel Polish), 3-ounce bottles, per dozen	1.20
Prepared Stove Putty, 10-pound cans, per pound	.10
Indestructible Fire Proof Stove Lining, 40-pound bags, per bag	.75
Indestructible Fire Proof Stove Lining, 100-pound boxes, per box	1.50
Indestructible Fire Proof Stove Lining, 400-pound barrels, per pound	.01¼
Pure Ceylon Lead, very finely ground, 5, 10 and 25-pound boxes, per pound	.10

No charge for packages or drayage.

James Mann & Sons, Buffalo, N. Y., as will be seen from their announcement on page 30, are quoting 6, 8 and 10 inch Heavy Strap Hinges at discount 70 per cent., delivered.

The Lewis Hinge Works, Columbus, Ohio, issue, August 20, a price list of their Lewis Patent Strap and T Hinges, as follows, the discount on Strap Hinges being 50 per cent., and on T Hinges 50 and 5 per cent., 60 days, or 2 per cent. discount for cash in 15 days:

Patent Heavy Strap Hinges.

Size	5½	6½	8½	10 inches
List, per pound	$0.16	$0.14	$0.13	$0.13

Patent Heavy T Hinges.

Size	2½ x 8	2½ x 4	3 x 4½	3 x 6
List, per pound	$0.15	$0.15	$0.14½	$0.14

ITEMS.

Henry B. Newhall Company, 105 Chambers street, New York, and 47 Pearl street, Boston, announce that they will discontinue the jobbing Hardware branch of their business after September 1. They will continue to carry in stock for the accommodation of their customers a full line of the goods made by the manufacturers whom they represent, and will also continue the lines which they are manufacturing themselves. In order to save their customers the extra expense of handling goods in New York, they will, as far as practicable, make direct shipments from their various factories. Their customers are invited to send their orders either to them or direct to the manufacturers whom they represent, their arrangements being such that they can guarantee lowest factory prices on all orders intrusted to them.

Announcement is also made, August 16, by H. S. Woolley, Henry Moore and C. A. Baynon, who have prominently been connected with the Henry B. Newhall Company, that they have succeeded to the jobbing department of the Henry B. Newhall Company under the title of the Woolley & Moore Company, 89 Reade street, New York. They will be in the market to supply all goods contained in the Henry B. Newhall Company's catalogue of 1885, which they will continue to use for the present. Having had long experience in the jobbing business they allude to their ability to serve their customers well, and at the lowest market prices. Of the company H. S. Woolley and Henry Moore are managers and C. A. Baynon secretary.

The Silver & Deming Mfg. Company, Salem, Ohio, issue a convenient, compact edition of their illustrated catalogue, representing the leading Pumps of their manufacture, of which illustrations are given. Other connected lines are also represented. A circular is also sent out devoted to their Feed Cutters, in which the different styles which they manufacture are described.

We take pleasure in laying before our readers the following communication from M. C. Hawley, of this city, president of the Hawley Bros. Hardware Company, correcting an erroneous report in regard to the recent fire in San Francisco. Our readers will note with satisfaction that the loss suffered by the company is much less than at first reported, and leaves them in a position to carry on their business without serious interruption.

NEW YORK, August 25, 1886.

To the Editor of The Iron Age: Fearing your numerous readers may be misled by a press dispatch from San Francisco on Sunday last to the New York daily papers, wherein it was stated that one of the largest fires that ever took place in that city had destroyed $2,000,000 worth of property, and that among the heaviest losers was the house of Hawley Bros. Hardware Company, extensive dealers in Agricultural Machinery, &c., we desire to correct the report by saying that the fire did not destroy our business house, corner Market and Beale streets, of that city, but one of our storage warehouses a mile from our place of business. The contents of this warehouse were for the most part burned, but the loss was fully covered by insurance, and does not interfere with our daily business.

C. J. Grellner, St. Louis, Mo., issues a neat circular describing his Lock Wedge, and giving cuts of the different kinds and sizes made. It thus represents the different shapes and sizes of Axe Wedges, Hatchet Wedges, Hammer Wedges, Long and Short and Solid Wedges.

George Klinkhart, Sharon Springs, N. Y., who was burned out last December, has erected a two story and basement brick building, 50 x 75, in which he will carry on his Hardware, Stove and Tinware business.

M. Bare, Hamilton, Ohio, issues, under date September 1, an illustrated price list of Hand Agricultural Implements manufactured by him. He calls special attention to his Genuine Solid Eye Hoes, both square and oval eye, which are described as made of one solid piece of crucible cast steel, without weld in the eye or blade.

The William Rogers Mfg. Company, Hartford, Conn., for whom the V. P. Humason Company are agents, 80 Chambers street, New York, will issue early next week a new catalogue of both Flat and Hollow Ware, showing extensive additions to their line.

George W. Morley, of Morley Bros., East Saginaw, Mich., with his family, has been spending the summer in Switzerland at a watering place in the mountains. He is expected home in October.

The Columbus Bolt Works, Columbus, Ohio, are issuing a circular in regard to their Champion Bolt, manufactured from soft steel, which for two years has been on the market, and alluding to the fact that after the Bolt began to have a reputation a similar article made by other manufacturers who worked it cold from round rods was put on the market. The result is stated to have been that many parties in the trade purchased such goods and found them unsatisfactory, owing to the heads flying off under pressure or concussion in driving in with a hammer. Then they add :

This fact has led to the abandonment of the use of this material by nearly every Rivet manufacturer in the country whose process of manufacture involves working the stock cold, and has caused a prejudice to spring up in the minds of some against this material in Bolts. We can truthfully say in regard to our Champion Bolt that out of the many millions we have put upon the market we have not had a single well-grounded complaint, and the object of this circular is to assure our customers that we will guarantee every Bolt manufactured under our Champion brand to be entirely satisfactory in every respect.

As relating to a comparatively new article and the general question as to the advisability of using steel in such Bolts, the above may be of interest.

Our readers will be interested in the announcement on page 24, of the Herrmann-Parker Hardware Mfg. Company, St. Louis, Mo., relating to their line of Gray Iron Shelf Hardware, and calling attention to some of their specialties, such as Axle Pulleys, Well Wheels, Grindstone Fixtures, &c.

The American Bolt and Screw Case Company, Dayton, Ohio, whose Bolt and Screw Cases are so well known to the trade, and to whose Hardware Revolving Case we recently called attention, have just put on the market a Revolving Boot Case, which is intended for displaying and retailing boots. It is octagon in shape, with square base, which is 3 feet 4 inches square, containing four drawers. The Case is 6 feet 3 inches high, and is made to contain 72 pairs boys' and youths' boots, or 60 pairs men's boots. The company report that for their Screw and Bolt Cases they are having a constant demand from all parts of the world, which has been so steady that they have not been able to catch up with their orders since January 10, and are at present more than 20 orders behind.

Announcement is made that W. F. Janeway, Barnesville, Ohio, and George Janeway, Junction City, Ohio, have consolidated their interests under the firm name of W. F. Janeway & Co., 27 East Spring street, Columbus, Ohio. The manufacturing will be under the personal supervision of George Janeway, whose long experience is alluded to. It is announced that they will offer a line of Pieced Tinware, Stamped and Japanned Ware, Spoons, House Furnishing Goods, &c., as at low prices as good goods can be sold, and to tinners they offer a stock of Tin Plate, Sheet Iron, Zinc, Wire, Rivets and Copper and a full line of Tinners' Trimmings, Stamped and Japanned Ware, also Stoves, Hollow-ware and Castings.

It will be seen that Dame, Stoddard & Kendall, Boston, Mass., call attention on page 10 to their complete stock of all styles and sizes of the Acme pattern Skates, manufactured in this country, which they are prepared to deliver at short notice. They also allude, it will be seen, to the Starr Mfg. Company's Forbes patent Acme Club Skates, for which they are sole agents.

It will be observed that among the Special Notices is the inquiry of a well-known company for a Superintendent to take charge of their factory. The qualifications required in order to fill the position satisfactorily are mentioned in the advertisement, and it is intimated that a good salary and a permanent position will be given to the right man.

William Blair & Co., Chicago, Ill., send out, August 20, a price list of seasonable goods, in which they call attention to the fact that there have not been many changes in prices during the past month, though manufactures are generally stiffening up somewhat and some lines have advanced. Business is referred to as active for the season and the prospects encouraging.

Wilkinson & Eastwood, Binghamton, N. Y., issue a new illustrated catalogue, 1886–87, showing the line of Chairs, Children's Sleighs, Express Wagons, Velocipedes, &c., which they are manufacturing. To meet the wants of the trade they have added several styles of Chairs and Children's Sleighs to their list. The catalogue shows a large variety of styles of these goods, which are illustrated and described, with list prices. All articles in the list except the Chairs are subject to a discount of 30 per cent.

The Lake Huron Stone Company, 34 and 36 Roberts street, Chicago, Ill., in a recent circular make the following announcement :

We have severed our connection with the Berea and Huron Stone Company, and shall continue in the Grindstone business, keeping the yard, warehouse and office at 34 and 36 Roberts street, Chicago, which have been used heretofore by ourselves and others jointly under the name of the Western Grindstone Company. With the increased amount of storage room which this change furnishes us, we shall add to our present stock a large and fresh stock of Lake Huron Grind and Scythe Stones, also Mounted Stones of special quality. Mounted Stone we can furnish with either knock-down or set-up style of hangings and the best styles of frames.

They then call attention to some of their principal brands and announce that they shall be prepared to fill all orders promptly and at the lowest possible prices.

Birmingham Plane Mfg. Company, Birmingham, Conn., issue a circular describing their new patent Adjustable Iron Planes and other specialties, a line of goods that has not been prominently on the market until the organization of the present company last winter, since which time preparations have been pushed for their more extended manufacture. The company, besides calling attention to the simplicity, durability and excellence of workmanship of these Planes, allude especially to their ease of adjustment and the fact that they will work well upon hard knots.

Wayne & Co., 422 Commerce street, Philadelphia, Pa., issue a Malleable Iron Key Blank catalogue, showing an assortment of the goods indicated.

National Tubular Axle Company, Chicago, Ill., call the attention of the trade to recent tests made by Hunt & Clapp, Pittsburgh, showing the strength of their Axles. It is stated that their No. A–4 Farm Axle (2¾ O. D.) was submitted to an average tensile load of 67 tons and a crushing load of 59 tons for each Axle before breaking, and to a transverse strain of between 13 and 14 tons on each Axle before crushing in; and that their No. A–1 Farm Axle (2½ O. D.) was submitted to an average tensile load of 45 tons for each Axle and a crushing load of 38 tons for each Axle before breaking, and to a transverse strain of nearly 9 tons for each Axle before crushing in.

THE ARRANGEMENT OF HARDWARE STORES.

Larabee & Barnes, Amsterdam, N. Y., favor us with a communication in regard to the management of Iron, and describing the arrangement of cellar illustrated herewith. From their letter we make the following extract, which explains the method alluded to:

As for Iron, the most convenient place for it, of course, would be on the first floor, where Shelf Hardware, Cutlery, Silverware and showcases are usually found. The most natural place for it, however, in our city would be in a separate building or in a good, dry cellar, where we would have our stock of Iron—Hoop and Band Iron, Horseshoes, Skeins and Boxes, Sash Weights, Coil Chain, Tackle Blocks, Rope, Wheelbarrows and some other goods. In front as you enter, and on the left, as shown in the accompanying illustration, Fig. 130, we would keep Horseshoes in kegs, and where shown in diagram would have a case for Horseshoes, made of coarse lumber, with enough separate apartments to accommodate all the different sizes of Light and Medium Horseshoes, Snow and Mule Shoes, if carried. Have a place for each size large enough to hold 1½ kegs, and have each apartment lettered, indicating the size of Shoe kept therein. On top of this case would have our stock of Coil Chain. Would have Scales about where shown in diagram, and have them placed on a good, solid pedestal about 18 inches high. The Hoop Iron rack, which could be used also for Band Iron, should be made in the

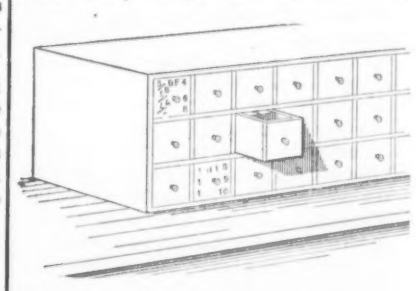


Fig. 131.—Shelf Screw Case.

shape of the letter A, with iron rods running through the sandards and projecting 14 inches. Inside would keep Toe Calk Steel and Horseshoe Iron. The Iron rack should have in depth four wood standards, size 2½ x 4 inches, and as many in width as would be necessary to accommodate the stock to be carried. Through these standards bore holes for ⅝ Round Iron, on which the stock will rest, and let the rods project on each side of rack 14 inches, one side to be used for Round Iron in bundles from ⅜ to ⅝ inch, inclusive, and the other for Band Iron or Tire Steel in bundles. Keep the small sizes of Flat Iron nearest the top, and the heavy Iron nearer the floor. To the floor joists above fasten large bright wire screw hooks, which will support ½-inch rod of Iron, which will make a device for keeping stock of Tackle Blocks, and will be out of the way in any part of the cellar. If oil is used for lights, have the tanks under the stairs. It is presumed in our plan that artificial light shall be used in the cellar at all times.

The following description of method of handling retail stock of Screws comes to us from St. Louis from a correspondent from whom our readers have heard before :

I send you herewith a drawing of a Shelf Screw Case, Fig. 131, to be applied or placed in the shelf above the counter. It contains

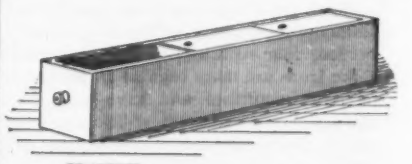


Fig. 132.—Drawer for Screws.

48 drawers, and each drawer has three apartments for Screws, as represented in Fig 132, so that the entire case has 144 apartments, enough for both Iron, Flat and Round Head and Brass Screws of the sizes which are usually kept by the retail trade. The sizes are painted on each drawer, and where Round Head Iron Blued or Brass Flat Head are put in drawers it can be indicated by painting the letters "R. I." for Round Head Blued, and "B. F." for Brass Flat Head, between the sizes above the porcelain knob on the drawer. The drawers have each two slide tops, Fig 132, working in a groove, so that only one size is exposed. This keeps the sizes from being mixed. The slides can easily be moved by a slight pressure of the finger. The following are the dimensions of the Screw Case, with the number and sizes of the drawers :

Whole length ..... 60¾ inches. Depth 16 inches
Hight ..... 10¾ inches.

	Width.		Hight.
33 Drawers	2¾ inches	x	2¾
3 Drawers	4 inches	x	3¾
3 Drawers	4¾ inches	x	3¾
3 Drawers	5¾ inches	x	2¾
3 Drawers	5¾ inches	x	3¾
3 Drawers	5⅞ inches	x	2¾
48			

HARDWARE CHARLIE.

WHAT THE TRADE SAY.

The following timely and suggestive letter is from a prominent wholesale Hardware house, and touches upon topics which we commend to the thoughtful attention of our readers. We shall be glad to have an expression of views upon the points to which our correspondents refer :

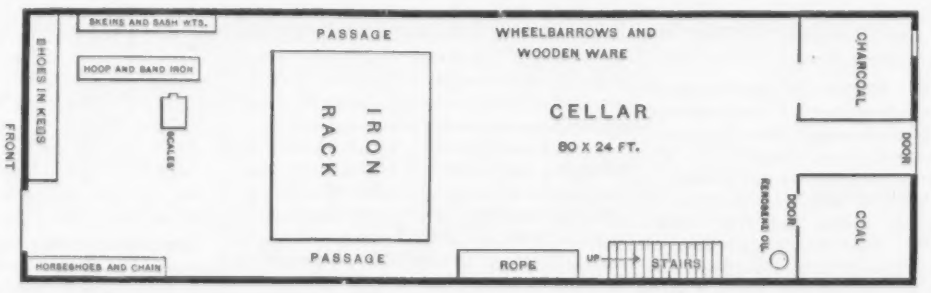


Fig. 130.—Cellar Arrangement.

To the Editor of The Iron Age: The somewhat protracted discussion in your columns of the best arrangement of Hardware stock, economical appliances for handling

goods, &c., have been of no little interest to your wide circle of readers. Suggestions made there will prove doubly valuable to those who have not had the opportunity to travel extensively and observe for themselves. There is another field of inquiry, however, no less broad and certainly of as much importance, that up to now, so far at least as public prints are concerned, is left untouched. It is indeed a question just how far public discussion of them will prove beneficial. It is in regard to the disposition of the living force of the house—*i. e.*, the regulation of employees. The tendency of the age is doubtless toward more latitude, more liberality to subordinates, as the relations of the latter with principals has grown more intimate year by year. With a view to discover what has been proven the fairest method, and consequently productive of the best results, would it not be worth while to make discussion on the following points—all or any of them :

Co-operation.

1. The desirability of all employees participating in the earnings of the house.

2. If desirable, to what extent, and upon what basis ?

3. Should such an arrangement imply proportionate responsibility for losses in case of a bad year, or under any other circumstances ?

4. The effect in case of general participation on the employees toward each other.

Compensation for Salesmen.

1. Whether it is better to have a fixed salary or one based on profits realized from individual sales, or a combination of both.

2. In case of either of the two latter plans, what is a fair percentage, and what orders should be thus credited—*i. e.*, all that issue from the traveler's assigned territory, or only on such as he himself sends in ?

3. What is the best method of keeping such a record, and what goods are commonly excluded from such arrangements ?

This last is a particularly interesting point, as indicative of what goods are assumed to bear an insignificant, if any, profit whatsoever.

Vacations and Absences.

1. What length of time is allowed for the annual vacation without loss or diminution of salary?

2. Is it customary to extend this on request at the cost of the absentee ? What classes does this embrace, if any difference is made ?

3. How far is it desirable to charge up absences throughout the year not classed under the annual vacation ?

Engagements.

Is it better to engage an employee for a definite or indefinite time ? This question is pertinent, because it is generally reported that one of the largest houses in the country leaves it open to employees to quit when they choose, the house reserving on its side the right to discharge when it chooses to do so.

Responsibility for Errors.

1. How far should employees be held to strict accountability for errors in packing, shipping, billing, &c.? These errors are liable in the course of a year to aggregate no inconsiderable loss. Should this be stood by the house or by the one paid to do his work correctly ?

2. How far does the exaction of penalty bring about accuracy ? Is it a remedy at all for errors ?

It will be observed that only a few of the countless questions that arise are indicated above. The idea is to elaborate them somewhat by discussion. If such proves interesting or instructive the inquiry might be extended to include the best forms for travelers' reports, notification of change of prices, &c. So much of the business of large houses has become a matter of office-work and routine that most desirable forms of stationery alone might well form the theme for a long paper. WHOLESALE.

Writing from Indiana, a Hardwareman says :

During the past three days we have been favored with seven traveling men in the Hardware line, not counting Stove representatives. All complain of light trade and small orders through this immediate section of country. Further South crops have been of such a character as to justify larger bills being bought.

At the general meeting of the shareholders of the Panama Canal Company, held on July 29 at Paris, the commissaries' report for the year ending June 30, 1885, was read, from which it appeared that the total assets amounted to 359,095,170 francs, and the expenditure to 141,852,877 francs, leaving a balance in hand of 217,242,292 francs. Since the formation of the company up to the middle of 1885 a sum of 495,862,076 francs, or nearly £20,000,000, has been spent. A supplementary report read by M. H. Cottu contains an interesting statement to the effect that the canal has been constructed to a depth of 20 feet, and to a distance of 10 miles from Colon. When M. de Lesseps rose to read the general report on the position of the company he succeeded in dispelling any uneasiness that may have existed in the minds of the shareholders. M. de Lesseps confidently predicted that by the end of 1889 the canal would be finished, or would be at least so near its completion as to admit of vessels passing from one ocean to the other. Since the last general meeting three large contracts have been made, so that at present there does not remain a single section which private enterprise has not undertaken to excavate.

METALLURGICAL.

Fire-Brick Stoves in Upper Silesia.

So late as 1882 doubts were expressed by so eminent an authority as Bergrath Juengst that brick stoves could not be used in the Upper Silesia iron district. It was feared that the high percentage of lead and zinc in the ores would soon coat the walls of the stoves with oxides of lead and zinc, thus lowering their efficiency very soon. It was thought that the zinc dust accumulating in the apparatus would be carried into the furnace by the blast and cause disturbances; that, furthermore, the gases would not be fit for raising steam, so that auxiliary firing would become necessary. It was feared that the zinc crusts growing on the walls would drop into the furnace at intervals, deteriorating the quality of the gas, running down the temperature of the blast and causing irregularities. In spite of these ominous predictions, Macco, of Siegen, induced the Reden Works to put in Whitwell stoves late in 1883. The furnace is 63.16 feet high, and has a capacity of 10,500 cubic feet. The hight of the three Whitwell stoves is 64.96 feet, their diameter 21.98 feet, and the heating surface of each 25,833 square feet. The principal ore used at the Reden Works is a brown hematite, which, dried at 110° Celsius, carries from 36 to 40 per cent. of iron, 19 to 24 per cent. of silica, 3 to 5 per cent. of manganese, 1 to 1.5 per cent. of zinc and 0.5 to 1 per cent of lead. It carries from 15 to 30 per cent of moisture as it comes from the mine. About one-third of the charge is made up of puddle cinder containing 18 per cent. of silica, 44 per cent. of iron and 7 to 8 per cent. of manganese, reheating cinder with 40 to 50 per cent. of iron, also 5 per cent. of pyrites cinder or blue billy, and 5 per cent. of hammer scale. The average yield is 34 to 36 per cent. Dolomite containing 10 per cent. of iron is used as a flux. The make is from 50 to 55 tons a day; the coke has 7 to 8 per cent. of ash, the fuel consumption being 1.6 tons per ton of iron. The blast pressure at the tuyeres is 3½ to 4 pounds, and the blast temperature 600 to 650° Celsius The cost of production is 39.60 marks per ton, against 54 30 marks before the introduction of the brick stoves. Although the greater part of this cheapening is due to a decline in raw materials, a part of the economy realized is due to the use of the Whitwell stoves. The following analyses show the composition of the dust collected :

Condenser.	Silica.	Iron.	Lead.	Zinc.
No. 1.....	22.56	14.17	8.50	19.44
No. 2.....	14.17	12.45	7.92	25.92
No. 3.....	10.66	7.45	7.18	30.45
No. 4.....	10.41	6.72	6.89	32.00
No. 5.....	7.49	3.99	7.24	35.32

The dust from the flues contains 10.28 per cent. of silica, 6.13 per cent. of lead and 42.40 per cent. of zinc. The dust from the stoves and chimney, which is worth 3 marks per cwt., is free from iron, contains 40 to 42 per cent. of zinc, 6 to 8 per cent. of silica and 4 to 6 per cent. of manganese. In a month 400 cwt. of dust were collected behind the spray washer and 600 cwt. from the flues before the spray washer. The latter sells for 2 to 2.50 marks and the latter for 0.75 mark per cwt. The predicted troubles have not, therefore, stood against the Whitwell stoves in actual practice.

Method for Estimating Temperature of Open-Hearth Furnaces.

M. Ch. Walrand describes in the *Annales Industrielles* the following method for approximately estimating the temperature of open-hearth furnaces which he had seen in use on a trip to Germany. When the workman wants to find out whether he has approximately the right heat he runs into the furnace, through a hole in the working door, a round iron bar 0.31 inch in diameter. He leaves it in the furnace 26 seconds, measured by a rough pendulum beating seconds, and then withdraws it quickly. If the furnace is very hot the end of the rod must be at a white welding heat, and when drawn quickly through the air throws off sparks of iron. If the heat is too low the rod comes out of the furnace red or yellow. Of course this is only a rough test, but when the rod throws off sparks it warns the melter that he must be careful, since a higher heat may soon damage the furnace.

The Herbertz Suction Cupola.

Considerable interest has been shown lately in Germany in the Herbertz suction cupola, invented by T. A. Herbertz, of Cologne. Its principal feature consists in an arrangement by which the air is supplied by suction through the aid of a steam jet in the main flue. The air is drawn in through a slit similar to the tuyere ring of the Mackenzie and Fowler cupolas. Becker has made a series of tests with the cupola, an account of which he gave at a recent meeting of the Bochum section of the German Society of Engineers. Prof. F. Fischer, of Hanover, has shown that a considerable proportion of the carbon of the fuel consumed in a cupola burns only to carbonic oxide, thus entailing a waste of fuel. The following table shows the analyses of gases taken by Fischer (I to IV) and by Becker (V to VII), the last being from a Herbertz cupola :

Cupola.		Coposition of waste gases. Volumes.		
		Carbonic acid.	Carbonic oxide.	Oxygen.
I. Krigar.....	1st day..	16.55	4.17	0
Krigar.....	2d day...	15.76	4.81	0
II. Krigar...	.....	13.23	7.68	0
III. Unknown.....	1st day...	13 90	6.35	0
Unknown.....	2d day...	12.42	6.15	0
IV. Unknown.....	1st day...	16.80	2.55	0
Unknown.....	2d day...	14 22	8.93	0
V. Ireland.....	1st day..	13.86	4.02	0
(Foundry)....	2d day...	12.50	11.73	0
VI. Ireland (Bess. works).	.....	15.9	8.0	0
VII. Herbertz.....	1st day...	10.7	0.0	6.7
Herbertz.....	2d day...	11.5	3.4	8.2

How great is the waste due to the burning of carbon to carbonic oxide instead of carbonic acid may be gathered from the following figures, in which the heat-units developed as deduced from the analyses just quoted by the carbon contents of 100 c. m. of gases are compared with the theoretical calorific value, had nothing but carbonic acid been found :

Cupola.		Heat developed by carbon in 100 c. m. gas. Units.	Heat developed by perfect combustion. Units.	Coke consumption. Per cent.	Waste of iron. Per cent.
I. Krigar.....	1st day.	77,452	90,001	...	...
Krigar.....	2d day.	74,818	89,284	8.7	8
II. Krigar.....	.....	68,998	95.182	6.32	...
III. Unknown...	1st day.	68,815	87.991	...	...
Unknown...	2d day.	62,105	80,638	...	...
IV. Unknown...	1st day.	76,359	84,022	5.5	6.5
Unknown...	2d day.	73,602	100.515	6.7	6 4
V. Ireland.....	1st day.	66,536	77,619	19.0	....
Ireland.....	2d day.	69,878	105,202	13.3	....
VI. Ireland.....	.....	75,759	99,869	14.0	....
VII. Herbertz...	1st day.	.....	46,460	5.0	2.66
Herbertz...	2d day.	54,256	64,802	10.2	2.45

The coke used on the second day in the Herbertz cupola contained 20 per cent. of moisture. Professor Becker attributes the high fuel consumption of ordinary cupolas to high pressure of the blast, generally 400 mm. water column, which is necessary to force the air through the tuyeres and unduly increases the zone of combustion. Proof of this is furnished by the analyses made of the gases from an Ireland cupola at different hights above the tuyere line :

	0.5 m. above upper tuyeres.	1 m. above upper tuyeres.	1.5 m. above upper tuyeres.
I.			
Carbonic acid.....	0.0	15.7	15.3
Carbonic oxide...	2.0	5.6	7.8
Oxygen.....	15.0	1.1	0.0
II.			
Carbonic acid.	0.0	13.2	12.6
Carbonic oxide.....	2.2	8.7	12.3
Oxygen.....	15.0	1.0	0.0
III.			
Carbonic acid.....	0.0	12.0	10.0
Carbonic oxide	4.0	11.6	15.5
Oxygen..	13.2	0.0	0.0
IV.			
Carbonic acid.	....	....	12.1
Carbonic oxide.....	....	...	11.3
Oxygen.....	....	....	0.0

Herbertz claims that this source of loss is overcome by his employment of a steam jet, whereby the pressure is reduced to 55 to 80 mm. water column. He insists, too, that a second drawback is avoided—that of burning out larger quantities of the constituents of the iron and thus increasing the waste. The following analyses of iron before and after melting are quoted :

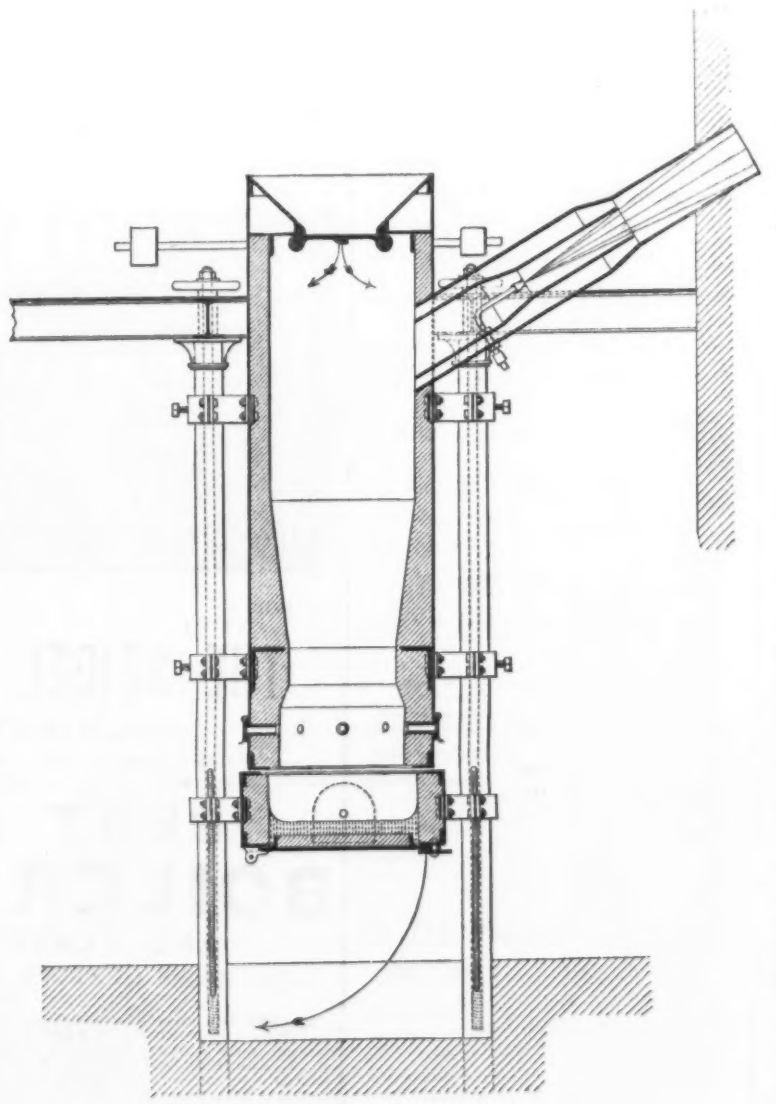
Kinds of iron.	Composition before melting.	Composition after melting.	Eliminated. Per cent.
Coltness No. 1.			
Carbon.....	4.089	3.945	2.8
Silicon.....	2.523	2.406	4.6
Manganese..	1.273	1.122	11.8
Gute hoffenungs huette No. 1.			
Carbon.....	4.154	3.682	11.4
Silicon.....	2.056	1.846	10.2
Manganese.....	0.786	0.537	31.7
Gleiwitz			
Carbon.....	4.173	3.586	14 1
Silicon.....	1.528	1.447	5.3
Manganese.....	2.084	1.599	23.3
¾ Luxembourg No. 3; ¼ sprues (Herbertz cupola).			
Carbon..	3.568	3.569	5.3
Silicon.....	1.488	1.326	10.9
Manganese.....	0.734	0.613	16.5
Phosphorus.	1.582	1.532	....
Sulphur.....	0.088	0.132	....
Same mixture.			
Combined carbon....	2.972	2.536	17.0
Graphitic carbon	0.383	0.635	
Silicon.....	1.802	1.594	11.5
Manganese.....	0.552	0.396	28.3

The first three sets of analyses are taken from a series made by Professor Ledebur, while the last two were made on iron put through a Herbertz cupola. While the waste is rarely less than 6 per cent. in ordinary cupolas, Herbertz claims 2.66 per cent., and holds that for that reason a lower grade of iron can be used to make castings equal to those produced in other cupolas from better stock.

The accompanying engraving, reproduced from the last issue of the *Revue Universelle des Mines*, of Liége, gives a sufficiently clear idea of the construction of the cupola. One point not alluded to by Becker is mentioned in an article in the review just quoted by C. Brandenburg, of Brussels. That is the pressure of the steam required to produce a given suction. H. Hollenberg gives the following data collected by him, the air pressure being measured 3 feet above the tuyere line :

Steam pressure in boiler. Atmospheres.	Water column. Millimeters.	Time.
4.....	40	5.15
4.....	50	5.30
4½.....	60	5.40
4½ to 4¾	85	6.03
4½	80	6.10
4...	70	6.20
4¾	60	6.35
3½ to 4.....	65	6.50
3½.....	55	7.10

Mr. Brandenburg attributes the gradual rise of the pressure to the improvement of the draft of the chimney. The different accounts of European engineers are certainly very uniformly enthusiastic, some of them going so far as to assert that it will supplant other cupolas for general use.



THE HERBERTZ SUCTION CUPOLA.

Obituary.

Eli Whitney Blake, one of the oldest residents of New Haven, died on the 18th inst. at his home, No. 77 Elm street, in that city. He was born at Westborough, Mass,, January 26, 1795, and graduated from Yale College in 1816. For some years he was engaged with his uncle, Eli Whitney, at the arms factory at Whitneyville, and in 1825, with his brother, the late Col. Philo Blake, took charge of the business. In 1836 they formed a partnership with John A. Blake, a brother, and under the name of Blake Bros. established a hardware shop in Westville. In 1852 Mr. Blake superintended the macadamizing of city streets, and his attention was called to the need of a practical and economical stone crusher. Five years later he perfected his machine, the Blake stone crusher, which filled all the requirements. Mr. Blake devoted much of his time to scientific research. He was one of the founders of the Connecticut Academy of Arts and Sciences, and the author of many papers on scientific subjects, which were collected and issued in book form four years ago under the title "Original Solutions of Several Problems in Aerodynamics." The degree of LL D. was conferred upon him by Yale College in 1879. In 1822 Mr. Blake married Miss Eliza O'Brien, of New Haven, who died 10 years ago. Seven children survive Mr. Blake. For 65 years he was a member of Center Church, New Haven.

Mr. E. S. Chesbrough, the well-known civil engineer, died at his residence in Chicago, on August 18. Mr. Chesbrough was born in Baltimore in 1813, and began work at his profession at the early age of 15 years. In 1831 he joined the engineer corps of General McNeill, where he remained for 11 years. In 1846 he was engineer for the Boston Water Commissioners and afterward became city engineer. In 1855 he went to Chicago as chief engineer of the Board of Sewerage Commissioners. He held various other prominent positions in Chicago until 1877. Among his engineering achievements was the construction of the two lake tunnels through which Chicago's water supply is taken.

Mineral Production of the United Kingdom in 1885.

The mineral statistics of the United Kingdom for last year contain the following figures, which are contrasted with 1884 :

Minerals Raised in the United Kingdom.

	1885. Tons.	1884. Tons.	Inc. or Dec in 1885. Tons.
China clay, &c.	2,531,198	2,695,710	— 164 512
Coal..... . .	159,351,418	160,757,779	— 1,406,361
Copper ore and precipitate...	36,379	42,149	— 5,770
Iron ore.....	15,417,982	16,137,887	— 719,905
Lead ore.....	51,302	54,485	— 3,183
Oil shale.	1,770 413	1,518,871	+ 251,542
Salt	2,207,683	2,332,704	— 125 021
Slate, &c.....	468,954	485,664	— 16,710
Tin ore	14,376	15,117	— 741
Zinc ore	24,668	25,563	— 895

It will be seen that all the more important minerals show a decrease in 1885 with the exception of oil shale, the output of which rose from 1,518,871 tons in 1884 to 1,770,413 tons last year, an increase of 251,542 tons, or over 16 per cent. The subjoined figures are complementary to those given above :

Metals Obtained by Smelting.

	1885. Tons.	1884. Tons.
Copper.....	2,773	3,350
Iron..... ...	5,333,524	5,626,644
Lead.....	37,687	40,055
Tin.....	9,331	9,774
Zinc.....	9,778	9,919

These figures represent the amounts of metals attainable by smelting from British ores, and do not include the quantities produced from imported raw material. The decline in the production of tin, despite the marked advance in the price of the metal, is a rather noticeable feature. The small production of copper is largely accounted for by the extremely low price of the metal. The mineral production of the United Kingdom has been accompanied by the following accidents :

Mining Accidents in United Kingdom.

	1885.	1884.
Number of persons employed.....	561,676	564,496
Number of fatal accidents...	866	917
Number of deaths.....	1,214	998

On an average in 1885 there was one fatal accident to every 648 persons employed, and one death by accident to every 462 persons employed, but although these results compare unfavorably with those of the preceding year they are better than the average of the past 10 years.

NEW PUBLICATIONS.

SILESIAN SHEET ZINC AND ITS USE IN BUILDING.—Das Schlesische Zinkblech und seine Verwendung in Baufache. By F. Stoll, Jr., Stuttgart. Published by the Schlesische Act. Ges. fuer Berg bau in Zinkhuettenbetrieb. Lipsiec, Silesia, Germany. 1886.

The Schlesische Act. Gesellschaft, the largest of the works in the great spelter district of Silesia, has issued an excellent pamphlet describing and fully illustrating the different applications of sheet zinc in building, with estimates of cost of the different methods in current use in Germany. In an introduction historical data are given, followed by information general in its character concerning the properties of the metal and of sheet zinc proper. The bulk of the work, which is a compilation by F. Stoll, Jr., editor of the *Blech Industrie*, of Stuttgart, treats of the different methods of roofing with sheet zinc.

THE APPLICATION OF WIRE ROPE FOR THE TRANSMISSION OF POWER. By T. C. Roberts, C. E. Published by the Trenton Iron Company, Trenton, N. J.

The economy of wire rope to transmission of power is being gradually appreciated in this country, though it is far from being so general as it is in Europe. If Mr. Roberts's little pamphlet will aid in extending its sphere of usefulness it will do good service. It does not pretend to treat the subject exhaustively—in fact, it was only recently that Professor Reuleaux, of Berlin, published a paper from which much could have been borrowed to good advantage. But so far as it goes it is correct and instructive, and it can be only a matter of regret and not of censure that Mr. Roberts did not go more into detail.

TWENTY-ONE YEARS OF PROGRESS IN THE MANUFACTURE OF IRON AND STEEL IN THE UNITED STATES. By James M. Swank.

Mr. Swank has issued in pamphlet form the paper contributed by him to the forthcoming report for 1885 on the Mineral Resources of the United States by the Geological Survey. It is a statistical review based upon the figures collected for the American Iron and Steel Association, and does not contain any facts which are not accessible in the reports of the latter.

Commissioner Wright, of the United States Bureau of Labor, is collecting information for the second annual report of that bureau, which he proposes to issue by the time Congress meets again. The report will treat of two subjects—first, the strikes in the United States from 1880 until July 1, 1886, their cause, duration, characteristics and results; second, convict labor in the United States, with its relation to the free labor of the country. Congress at its last session by resolution specially instructed the Commissioner of Labor to collect and collate information on this subject. No special agents will be sent abroad by the bureau this year.

According to the report of the Finance Committee of the New York Board of Aldermen, the real estate of the city subject to taxation amounts to $1,203,941,065, and the personal property to $217,027,221, or a total of $1,420,968,286. This is an increase of $49,851,283. The Board of Estimate and Apportionment appropriated $35,736,320.59 for the conduct of the city government for the present year, an increase of $1,854,415.81 over the amount appropriated in 1885.

MECHANICAL.

Automatic Safety Grip for Hoists.

An ingenious automatic safety grip for all kinds of hand-hoisting machinery has been devised and is put on the market by Mr. L. E. Mansfield, of 374 Union street, Brooklyn, N. Y.

The engravings which we annex fully explain its arrangement and manner of working, Fig. 1 showing it attached to an ordinary three fold purchase. Extreme simplicity is one of the principal features of the device, and the cuts are therefore practically self-explanatory, especially Fig. 2, which represents a sectional view. The grip as there shown consists of a number of

Automatic Safety Grip, Made by L E. Mansfield, Brooklyn, N. Y.—Fig. 1.—Grip Attached to Purchase.

rings through which the hauling rope L passes and can work freely, the rings being arranged in a series and hinged on one side in a small box frame, F, attached to the standing block. On the other side they are joined by a small bar, A B C D. When the rings are in the position shown at the right of Fig. 2, or in a plane at right angles to the rope, the latter can readily move in an upward direction, but when they are inclined as shown at the left they act like a clamp by reason of the arrangement of their hinging points. It can readily be found that when the rings move upward to the inclined position points in their circumference at the left will describe arcs to

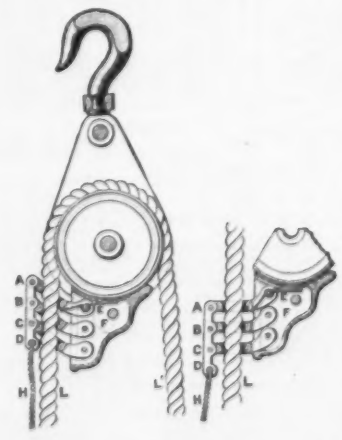


Fig 2.—Detail View of Standing Block, with Section of Grip Rings and Attachments.

the right, and points at the extreme right will describe arcs to the left, and the rope L will thus be firmly held as in a vise against any upward movement. The stronger the upward pull, moreover, the more tightly the rope will be gripped. At the same time, however, the grip offers no resistance whatever to a downward pull on the rope L, and a load may thus easily be raised and securely held at any point in its ascent. A slight pull on the small rope H, sufficient to overcome the ension of the spring E, which holds the grip rings up and against the rope end L, brings the rings to a horizontal position and thus releases the hold of the grip, leaving the rope free to move upward. It will be noticed that the action of the grip is entirely automatic, offering an absolute safeguard against slipping of the rope when sustaining a weight. The lost motion also is extremely small, constituting a feature whose importance will be readily appreciated. Practical test has satisfactorily demonstrated the efficiency of the device, and considering its wide range of applicability there seems to be no reason why it should not come into extended use.

Glass Bearings.

Glass bearings and bushes for loose pulleys are now made by an English firm, Messrs. Powis, Bale & Co., of London, presumably. Mr. Powis Bale's description says that with the object of reducing the working friction to its lowest limit, and experimenting with various materials, he determined to try glass, and being highly satisfied with the results in his early trials adopted it. "The bearings are grooved or crenated in such a manner that the lubricating material is kept in circulation between the top and bottom half of the bearings; at the same time a curreut of air is allowed to pass through the bearing, thus keeping it cool while in work." It might be expected that frictionless bearings would not need ventilation.

Solderless Floats for Boiler Gauges.

In our issue of September 3, 1885, we described and illustrated the Reliance Alarm Gauges for steam boilers, made by the Reliance Gauge Company, of Cleveland, Ohio. Reference to the issue in question will show that the gauges were furnished with hollow copper floats, which, rising and falling, according to the water level in the boiler, opened and closed whistle-valves to which they were connected.

To alarm gauges these floats are the most essential points, for the simple reason that when they either fill with water or collapse the gauges at once become inoperative. Every one interested in the use of metallic floats knows how unreliable soldered and bronzed floats are. The Reliance Gauge Company, we understand, tried soldering with various kinds of solder, and bronzing in every way known, but always with more or less unsatisfactory results. It is of interest, therefore, to note the manner in which they surmounted the difficulties The principle of their float is very simple, and will be understood from the annexed cuts. They are made of two spherical overlapping parts joined together over an inner band provided with internal flanges to give strength and furnish shoulders for the joint. Fig. 1 shows the parts before joined together. These parts are united by special machinery, and when completed make a float of wonderful strength, and as close-jointed as if of one piece and jointless. Perhaps the construction may be better understood by the sectional view, Fig. 2, of the float completed. These floats can be made of any desired shape and size on the same principle, but the following cuts illustrate the float used in the standard size Reliance alarm gauges. The floats, it is claimed, will stand with perfect ease 200 pounds pressure, and can be easily made so as to stand twice as much. That they are a success is shown by the fact that of several hundred now in use not one is said to have filled with water or collapsed, although many of them are working under pressures exceeding 100 pounds. This is notably true of those used in the

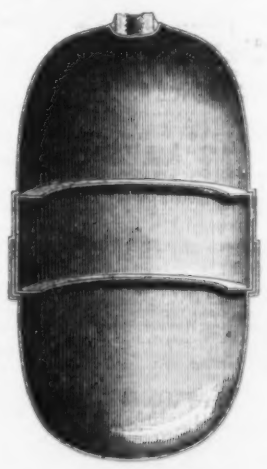


Fig. 2.—Sectional View.

Fig. 3.—Elevation.

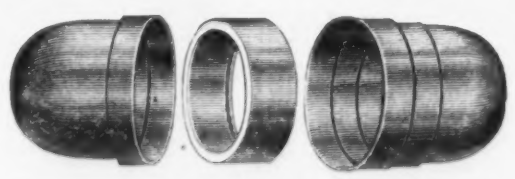


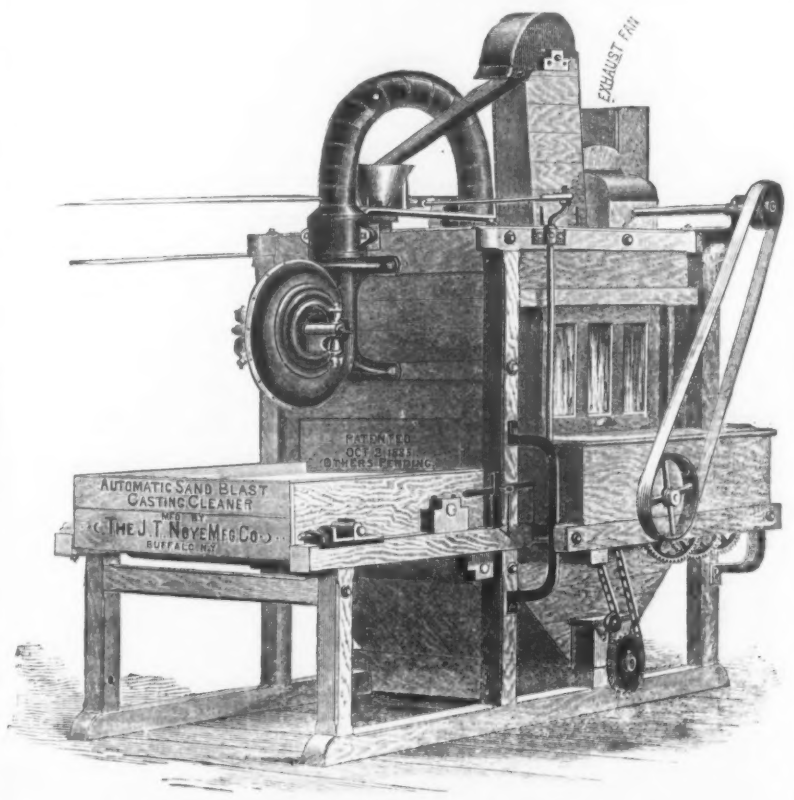
Fig. 1.—Parts Before Being Joined.

SOLDERLESS ALARM FLOATS, MADE BY THE RELIANCE GAUGE COMPANY, CLEVELAND, OHIO.

automatic safety engines made by the Rochester Machine Tool Works, where they have given the highest satisfaction.

The Buffalo Sand-Blast Casting Cleaner.

It is well known among handlers of iron and brass castings that great difficulty is experienced in removing sand and rough imperfections. The most careful and expensive methods are sometimes taken to accomplish this, such as hand scraping and similar processes. Even with all this there is likely to be an uneveness in the work produced. When castings are designed for nickel plating it is essential to nice clean work to have the sand and silicious skin of the casting removed in order to give a clean finish. It is almost impossible to do this by tumbling, brushing or hand scraping, but the sand-blast does it to a wonderful degree of perfection. The Buffalo Sand-Blast Casting Cleaner, of which we show a cut, is invaluable in enlivening and renewing castings covered with rust. The machine consists principally of a suitable wooden frame to accommodate an endless apron of wooden slats upon which is placed the castings to be operated on. Underneath this moving table is a hopper contracting at the bottom, in which is placed a suitable conveyer to receive the sand after having been forced on the castings. At one end of this conveyer is an elevator to raise the sand to the receiving funnel at the top of the machine. Back of the elevator head is located an exhaust fan to take proper care of the dust arising from the contact of sand and casting. In the center of the front of the machine is placed a pressure blower which is connected to a ∩ metal neck, one end passing down into the inside of the machine a suitable distance from the casting table. This neck receives a reciprocating motion by means of a rod and proper gearing at one side of the machine. This motion moves the sand-blast backward and forward in part circles. The funnel connects with this metal neck in such a way that as soon as it reaches the point of attachment it receives the air-blast and the sand is driven to the castings with great force. It will be noted that the consumption of sand is reduced to a minimum, it being used over and over again. Mechanical adjustments are provided for starting and stopping the machine and regulating the sweep of the metal neck, &c.



THE BUFFALO SAND-BLAST CASTING CLEANER.

The sand has no visible effect on any soft or yielding substance, but only acts where great resistance is offered. The effect on iron castings is to remove every particle of sand, rust, &c., in every crevice where the sand-blast can reach, so that it can be nickel plated much more perfectly. Art castings are thus brought out sharply and in detail. Two sizes of this machine are made, having 24 and 36 inch guages respectively. The makers are the John T. Noye Mfg. Company, of Buffalo, N. Y. The machines are in successful operation in the foundries of Rathbone, Sard & Co., Albany; Co operative Stove Company, Rochester; Perry & Co., Albany; S. S. Jewett & Co., Buffalo; Michigan Stove Company, Detroit, and many others.

A New Multitubular Boiler.

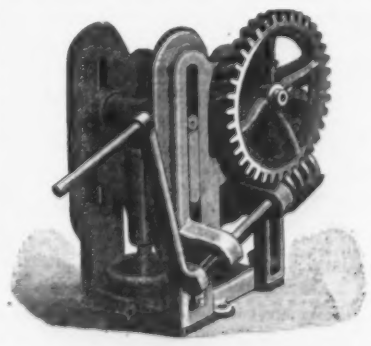
English papers have recently described a new form of multitubular boiler, built by Hipkins & Hipkins, of London. The novelty in the construction is found in a number of curved tubes which are expanded in the ordinary manner in the flues of Lancashire and Cornish boilers, and in the fire-boxes of vertical boilers. The number of these tubes is determined by the size of the boiler. Thus, in a flue 24 feet long, 60 tubes could be fixed after allowing 8 feet for the furnace; and in a 10 horse-power vertical, 42 tubes. The tubes in the Lancashire and Cornish boilers are so arranged that in case of repairs each end is accessible, and there is sufficient space in the flues to permit of a man getting at any part. From the fact of the tubes being curved they can be easily taken out and new ones fixed when necessary, although it is believed that in most cases the tubes would last as long as the boilers could be worked, for by having the tubes bent their expansion would not be in a longitudinal direction, as in the case of straight tubes, and thus there would be less strain on the ends. The shell of the vertical boiler is made so that it can be removed for repairs. The manufacturers claim that by this arrangement of tubes they have obtained the largest amount of heating surface, and that consequently fuel will be greatly economized over ordinary boilers. It is perhaps known to our readers that the water in Lancashire and Cornish boilers becomes heated much sooner over the flues than it does beneath them, but by introducing these tubes a rapid and perfect circulation of the water is obtained, and consequently the expansion of the boiler is uniform throughout, a matter of great importance. The addition of these tubes greatly strengthens the flue, as each one acts as a stay, so that the greater the number of tubes the greater would be the strength of the flue. Owing to the position of the tubes and the rapid circulation of water through them, no sediment could lodge in them. The ordinary scurf could easily be removed when the boiler was cleaned by pushing a scraper through the tubes.

Cylinders in Large Engines.

A corresponnent of the London *Engineer* asserts that the chief cause of cracked cylinders in large engines is starting the engines too soon. In large ships, he says, the steam can be got up in an hour in the boilers, but the engines should as a rule have from two to four hours to warm the cylinders, so that the metal will have no undue strain on it through unequal expansion when starting: sometimes they get it and at other times not. When the steam is up and just when the cylinders are warm enough to put the inner ring of metal in a state of compression, and the outer one in a state of tension, the engines are started at a speed quick enough to bring over a few buckets of water from the boilers, there are a few bangs and bumps, and then everything seems to be all right, but some time after when the cylinders are opened there is a crack found in one. Again, some of the cylinders in the merchant service, according to this writer, are very large, but they receive quite another sort of treatment; steam is up from four to six hours before starting, and when they do start there is no stopping, with few exceptions, till the ship gets in port again.

Tire Bender.

We show in the annexed cut a strong and powerful tire bender, put on the market by the Champion Blower and Forge Company, of Lancaster, Pa. This, we understand, is the only tire bender geared with a worm. It has a regular easy motion and allows no slipping of the tire or backward strain of the crank. It is guaranteed to bend from



Tire Bender, Built by the Champion Blower and Forge Co., Lancaster, Pa.

the smallest tire to 4 inches by 1 inch with comparative ease. The tire is easily removed by drawing the center roll straight out from the worm. The two end rolls are supplied with wrought iron collars in order to keep the tire from warping. The size of the tire is adjusted by a screw, enabling it to bend from a fifth weel to the largest tire. The weight of the machine is 235 pounds. The company make also a larger size machine with capacity to bend any tire made.

Calculating the Boiler for a Steam Pump.

Under the above head the Boston *Journal of Commerce* says:

Given the largest number of gallons which a pump will be required to pump per minute, and the hight in feet from the surface of the well from which the water is drawn to the point of discharge, we can easily tell by multiplying by 10—the weight in pounds of 1 gallon—the number of foot-pounds of power consumed per minute in lifting the water; adding a certain percentage for friction of the machine and of the water in the pipe, we have the total number of foot-pounds consumed per minute, and this divided by 33,000 will be the horse-power consumed. The allowance for friction will vary with the style, size and condition of the pump, the size of the pipe, and, above all, the manner in which the pipe is connected, the number of right angle turns, &c.

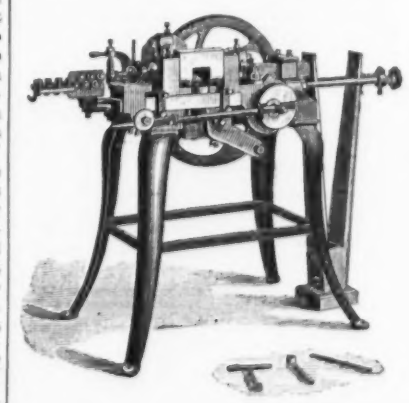
This may be arrived at in another way. A column of water 2.3 feet in hight exerts a pressure of 1 pound Allowing the 0.3 for friction, we can, by dividing the total lift in feet by 2, get the pressure per square inch which is being exerted against the water piston or plunger, and multiplying by the number of square inches in that piston gives the total pressure against which the pump is working. This multiplied by the piston speed in feet per minute and divided by 33.000 will give the lift in horse-power. In this case, as in the other, the lift must be calculated from the surface of the supply, and not from the pump, when the pump is lifting its supply. If the water flows to the pump, it must be calculated from the hight of the water cylinder. An allowance of, say, 25 per cent. should be made above the horse-power thus shown, in order to provide for contingencies and to be on the safe side.

In selecting a boiler for this load it must be borne in mind that a boiler sold for a certain horse-power is supposed to be able to furnish that power in connection with a good steam engine, and they are not apt to be overrated. Now the steam pump as usually built does not approach in economy the ordinary steam engine, and therefore a boiler which would develop 25 horse-power in connection with a good engine would be too small for a pump which was required to do the same amount of work. The evaporation of 30 pounds of water per hour from feed at 100° F. into steam of 70 pounds pressure has been adopted by several authorities as a horse-power. Any good automatic cut-off will run on this amount of water; and if an estimate can be made of the comparative performance of the pump under consideration, a close approximation to the desired size of boiler can be made.

The Brockton Wire Nail Machine.

Wm. A. Sweetser, of Brockton, Mass., is putting on the market a new wire nail machine, a general view of which is shown in the cut which we annex. In this machine the builder claims to have overcome most of the failings of other tools of this class, and to have turned out a machine superior in many important points, such as range of work, speed and capacity for adjustment.

The dies and knives are of the simplest kind. The hammer, gripper and cutter-jaw cams are cast solid on the spindle and ground true. Chilled gun-metal spindles are used. The levers run on hardened-steel centers in bronze boxes, and all



New Wire Nail Machine, Built by Wm. H. Sweetser, Brockton, Mass.

lost motion can be readily taken up. One wrench fits all the principal set and collar screws. One eccentric operates both knife levers, so that they must move together and in time. The different lengths of stock to make the head can be easily secured by moving the knife levers to or from the dies. The machine is very strong and compact, and still there are no parts or operations but what are in plain sight, a point that is appreciated by the operator. Attention is called also to the snap-feed and hook-feed rod, giving the operator a chance to start the machine before the nail is fed or cut, and to stop the feed in an instant if required, saving stock and breakages. The machine weighs about 1100 pounds and turns out nails from ¼ inch to 3 inches long, and from No. 25 to No 10 wire.

A Lubricant for Brass.

Lard and grease have, as is well known, a corrosive action on brass and copper, and this is a drawback to their use as lubricants for these materials. It has been pointed out that, while both melted india-rubber and vaseline are without corrosive action on brass, each alone has a disadvantage. Thus melted india-rubber is too glutinous and in course of time hardens. Vaseline never hardens, but it is deficient in tenacity and adhesiveness. A mixture of both substances is therefore recommended, consisting of 1 part by weight of melted india-rubber and 2 parts of vaseline. The rubber should be pure, not vulcanized, and cut into shreds, then melted at the lowest possible temperature in an iron cup while being pressed down against the hot cup and stirred into a uniform glutinous mass. The vaseline of the common thick brown sort should be added to the india-rubber and the whole thoroughly stirred and blended together.

It is reported that the natural gas escaping from the mains in Pittsburgh is to be used in illuminating the streets.

Current Hardware Prices, August 25, 1886.

HARDWARE.

Ammunition.
Caps, Percussion, ₱ 1000—
Hicks & Goldmark's
F. L. Waterproof, 1-10's....50¢ } dis 25 %
E. B. Trimmed Edge, 1-10's....65¢ } dis 25 %
E. B. Ground Edge, Central Fire, 1-10's....70¢ } dis 25 %
Double Waterproof, 1-10's....$1.40 } dis 25 %
Musket Waterproof, 1-10's....54¢
G. D....28¢
S. B....30¢
Union Metallic Cartridge Co.
F. C. Trimmed....50¢ } dis 25 %
F. L. Ground....65¢ } dis 25 %
Cen. Fire Ground....70¢ } dis 25 %
Double Waterproof....$1.40 } dis 25 %
Double Waterproof, in 1-10's....$1.40 } dis 25 %
S. B. Genuine Imported....45¢
Eley's E. B....56¢
Eley's D Waterproof, Central Fire....$1.60
Cartridges—
Rim Fire Cartridges....dis 60&2 %
Rim Fire Military Cartridges....dis 15&2 %
Cen. Fire Cartridges, Pistol and Rifle....dis 40&2 %
Cen. Fire Cartridges, Military & Sporting..dis 30&2 %
Blank Cartridges, except 22 and 32 cal., an additional 10 % over above discounts.
Blank Cartridges, 22 cal....$1.50, dis 2 %
Blank Cartridges, 32 cal....$3, dis 2 %
Primed Shells and Bullets....dis 25&2 %
B. B. Caps, Round Ball....$1.60, dis 2 %
B. B. Caps, Conical Ball, Swaged....$1.75, dis 2 %
Primers—
Berdan Primers, all sizes, and B. L. Caps (for Sturtevant Shells)....90¢, dis 2 %
All other Primers, all sizes....$1.10, dis 2 %
Shell—
Paper Shot Shells, 1st & 2d or S. G. qual. dis 25&5&2 %
Selbold's Combination Shot Shells....dis 25&10&2 %
Paper Shot Shells, Club, Rival, Climax..dis 40&5&2 %
Paper Shot Shells, Star Brand....dis 50&5&2 %
Brass Shot Shells, 1st quality....dis 60&2 %
Brass Shot Shells, Club, Rival & Climax...dis 65&2 %
Wads—
U. M. C. & W. R. A.—B. E., 11 up....$2.00 } dis 20&2 %
U. M. C. & W. R. A.—B. E., 9&10....2.30 } dis 20&2 %
U. M. C. & W. R. A.—B. E., 7&8....2.60 } dis 20&2 %
U. M. C. & W. R. A.—P. E., 11 up....3.10 } dis 20&2 %
U. M. C. & W. R. A.—P. E., 9&10....4.00 } dis 20&2 %
U. M. C. & W. R. A.—P. E., 7&8....490 } dis 20&2 %
Eley's B. E., 11 up....$1.75
Eley's P. E., 11 @ 20....$2.80

Anvils.
Eagle Anvils....₱ lb 10¢, dis 20 @ 20&5 %
Wright's....9½¢
Armitage's Mouse Hole....9¢
Armitage Mouse Hole, Extra....11½¢
Trenton....9½¢
Wilkinson's....9½¢@10¢
J. & Riley Carr Patent Solid....11@11½¢
Anvil Vise and Drill—
Millers Falls Co....$18.00, dis 20 %
Cheney Anvil and Vise....dis 25 %
Allen Combined Anvil and Vise....$3, dis 40&10 %

Augers and Bits.
Douglass Mfg. Co. } ...dis 60&10 %
New Haven Copper Co. } ...dis 60&10 %
Wm. A. Ives & Co. } ...dis 60&10 %
Humphreysville Mfg. Co. } ...dis 60&10 %
French, Swift & Co. } ...dis 60&10 %
Connecticut Valley Mfg. Co. } ...dis 60&10 %
Snell's....dis 60@60&5 %
Cook's, Douglass Mfg. Co....dis 55 %
Cook's, New Haven Copper Co...dis 50&10@50&10&5 %
Ives' Circular Lip....dis 60 %
Patent Solid Head....dis 30 %
C. E. Jennings & Co., No. 10, extension lip....dis 40 %
C. E. Jennings & Co., No. 30....dis 60 %
C. E. Jennings & Co., Auger Bits, in fancy boxes, ₱ set, 32¼ quarters, No. 5, $5; No. 30, $3....dis 20 %
Lewis' Patent Single Twist....dis 45 %
Russell Jennings' Augers and Bits....dis 25 %
Imitation Jennings Bits (new list). dis 50&10@50&10&5 %
Car Bits, Snell Mfg. Co....dis 40&10&10 %
Car Bits, New Haven Copper Co....dis 50&10 %
L'Hommedieu Car Bits....dis 15 @ 20 %
Snell Mfg. Co.'s Jennings' Bits (new list)....dis 50&5 %
Forstner Pat. Auger Bits....dis 10 %
Hollow Augers—
Ives } dis 25&10 @ 25&10&5 %
French, Swift & Co. } dis 25&10 @ 25&10&5 %
Douglass' } dis 25&10 @ 25&10&5 %
Expansive Bits—
Clark's small, $18; large, $26....dis 35 @ 35&5 %
Ives' No. 4, per doz., $60....dis 35 @ 40 %
Swan's....dis 40 %
Ansonia....dis 25 %
Steer's, No. 1, $26; No. 2, $22....dis 35 %
Bonney's Adjustable ₱ doz., $48....dis 40&10 %
Stearns' Adjustable ₱ doz., $48....dis 20&10 %
Ives' Expansive, each $4.50....dis 45 @ 50 %
Universal Expansive, each $4.50....dis 20 %
Wood's....dis 25 @ 25&10 %
Gimlet Bits—
Common....₱ gross $3.00 @ $3.2
Diamond....₱ doz. $1.10, dis 25&10 %
"Bee"....dis 25 %
Double Cut, Shepardson's....dis 45 %
Double Cut, Ct. Valley Mfg. Co....dis 30&10 %
Double Cut, Hartwell's, ₱ gro, $6.50....dis 10 %
Double Cut, Douglass'....dis 40 %
Double Cut, Ives'....dis 50&10 @ 60 %
Holt's Patent....dis 40&10 %
Syracuse....dis 30 @ 30&5 %
Bit Stock Drills—
Morse Twist Drills....dis 50&10 %
Standard....dis 50&10 %
Cleveland....dis 50&10 %
Syracuse....dis 50&10 %
Williams' or Holt's....dis 50&10&10 %
Ship Augers and Bits—
L'Hommedieu's....dis 15 @ 20 %
Watrous's....dis 15 @ 20 %
Snell's....dis 15 @ 20 %
Snell's Ship Auger Pattern Car Bits....dis 15 @ 20 %

Awl Hafts.
Sewing, Brass Ferrule....$3.50 ₱ gross—dis 40&10 %
Patent Sewing, Short....$1.00 ₱ doz—dis 40&10 %
Patent Sewing, Long....$1.20 ₱ doz.—net
Patent Peg, Plain Top....$10.00 ₱ gross—dis 45&10 %
Patent Peg, Leather Top....$12.00 ₱ gross—dis 45&10 %

Awls, Brad Sets, &c.
Awls, Sewing, Common....₱ gross $1.70—dis 35 %
Awls, Shouldered Peg....₱ gross $2.45—dis 40@40&10 %
Awls, Patent Peg....₱ gross 63¢—dis 40@40&10 %
Awls, Shouldered Brad....$2.70 ₱ gross—dis 35 %
Awls, Handled Brad....$7.50 ₱ gross—dis 45 %
Awls, Handled Scratch....$7.50 ₱ gross—dis 35&10 %
Awls, Socket Scratch....$1.50 ₱ doz—dis 25 @ 30 %

Awl and Tool Sets.
Aiken's Sets, Awls & Tools, No. 20, ₱ doz. $10—dis 50&10 %
Fray's Adj. Tool Handles, No. 1, $12; No. 2, $18 } dis 25 @ 25&10 %
Miller's Falls Adj. Tool Handles, No. 1, $12; No. 2, $18 } dis 25 @ 25&10 %
Henry's Combination Haft....₱ doz. $6
Brad Sets, No. 42, $10.50, No. 43, $12.50...dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50 } dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 2, $4.00 } dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 3, $5.50 } dis 30&10 %

Axes.
Makers' Brands—
First quality....₱ doz $6.50 @ $7.00
Others....₱ doz $6.00 @ $6.50
Special brands....₱ doz $5.50 @ $6.00

Axle Grease.
Frazer's, in bulk....Keg ₱ lb, 4¢; Pail, ₱ lb, 5¢ net
Frazers, in boxes....₱ gross $9.50
Dixon's Everlasting, in bxs., ₱ doz., 1 lb; $1.20; 2 lb, $2
Dixon's Everlasting....10-lb pails, each, 85¢
Lower grades, special brands....₱ gro $5.50 @ $7

Axles.
Nos. 1 to 6....3¾¢; Short bed, 4¼¢
Nos. 7 to 18....dis 60&5 @ 60&10 %
Nos. 19 to 22....dis 70&5 %
Nos. 23 to 26....dis 60&5 %
National Wrought Steel Tubular Self-Oiling:
Standard Farm (1 to 5) and Special Farm (A1 to A5)
Less than 10 sets....dis 33⅓ %
Over 10 sets....dis 33⅓&5 %
X Strong Exp. (6 to 9), & XX Strong Truck (10 to 16):
Less than 10 sets....dis 10 %
Over 10 sets....dis 10&5 %

Bag Holders.
Sprengle's Pat., ₱ doz $18....dis 60 %

Balances.
Spring Balances....dis 50 %
Common 24 lb....₱ doz., $1.50—dis 50 %
Chatillon's Spring Balances....dis 50 %
Chatillon's Circular Spring Balances....dis 60 %

Bells.
Hand—
Light Brass....dis 75&10 @ 75&10&5 %
Extra Heavy....dis 65&10 @ 70 %
White Metal....dis 70 @ 70&10 %
Silver Chime....dis 25&10&5 %
Globe (Cone's Patent)....dis 25&10 %
Door—
Gong, Abbe's....dis 25&10 @ 35 %
Gong, Yankee....dis 40&10 %
Gong, Barton's....dis 40&10 @ 50 %
Crank, Taylor's....dis 25&10 %
Crank, Brooks'....dis 50&10&2 %
Crank, Cone's....dis 10 %
Crank, Connel's....dis 20&10 %
Lever, Sargent's....dis 60&10 %
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned....dis 25&10 %
Lever, R. E. M. Co.'s....dis 50&10&2 %
Pull, Brook's....dis 50&10&2 %
Pull, Western....dis 25&10 %
Cow—
Common Wrought....dis 60&10 %
Western....dis 20&10 %
Western, Sargent's list....dis 70&10 %
Kentucky "Star"....dis 20&10 %
Kentucky, Sargent's list....dis 70&10 %
Dodge, Genuine Kentucky, new list....dis 70@70&5 %

Nos.	0	1	1½	2	3	4	5	6	7	Hog
	$12.00	10.00	9.00	8.00	6.00	5.00	4.00	3.00	2.50	5.00

Texas Star....dis 50&10 @ 50&10&5 %
Call....dis 40@40&5 %
Farm Bells....₱ lb, 2¾ @ 3¢
Steel Alloy Church and School Bells....dis 40 %

Bellows.
Blacksmiths'....dis 50&10 @ 60 %
Molders'....dis 50@50&5 %
Hand Bellows....dis 50@50&5 %

Belting, Rubber.
Standard....dis 70&5 @ 70&10 % } dis 5 % cash.
Extra....dis 60@60&10 % } dis 5 % cash.
N. Y. B. & P. Co., Standard...dis 60&10 % } dis 5 % cash.
N. Y. B. & P. Co., Extra....dis 50&10 % } dis 5 % cash.
Cleveland Rubber Co., Extra..dis 60&10 % } dis 5 % cash.

Bench Stops.
Hotchkiss's....₱ doz $5.00—dis 10 @ 10&10 %
Weston's, per doz No. 1, $10; No. 2, $9...dis 25&10&5 %
McGill's....₱ doz $3—dis 10 %
Morrill's....₱ doz $9—dis 50 %

Bit Holders.
Extension, Barber's....₱ doz $15.00—dis 40&5 %
Extension, Ives'..₱ doz $20.00—dis 40&10 @ 40&10&5 %
Diagonal....₱ doz $24.00—dis 40 %
Angular....₱ doz $24.00—dis 40&5 %

Blind Adjusters.
Domestic....₱ per doz $3.00—dis 33⅓ %
Excelsior....₱ doz $10.00—dis 50&10&2 %
Washburn's Self-Locking....dis 20 @ 20&10 %

Blind Fasteners.
Mackrell's....₱ doz pairs, $1.00—dis 20@20&10 %
Van Sand's Screw Pattern....$15 ₱ gro.—dis 60&10 %
Van Sand's Old Pattern....$15 ₱ gro.—dis 55&10 %
Washburn's Old Pattern....$9 ₱ gro. net
Merriman's....new list, net
Salisbury & Austin No. 2008....$9 ₱ gro. net
Security Gravity....$9 ₱ gro. net

Blind Staples.
Barbed, ½ in. and larger....₱ lb 8 @ 8½¢ net
Barbed, ⅜ in....₱ lb 9 @ 9½¢ net

Blocks.
Tackle Blocks, &c, list Ap. 17, '85..dis 50&10@50&10&5 %
Reed Mfg. Co. Self-Lubricating....dis 50 %

Bolts
Door and Shutter—
Cast Iron Barrel, Square, &c....dis 70 @ 70&5 %
Cast Iron Shutter Bolts....dis 70 @ 70&5 %
Cast Iron Chain (Sargent's list)....dis 65&10 %
Ives' Patent Door Bolts....dis 55 %
Wrought Barrel....dis 70 @ 70&5 %
Wrought Square....dis 70 @ 70&5 %
Wr't Shutter, all Iron, Stanley's list....dis 60&10 %
Wr't Shutter, Brass Knob, Stanley's....dis 40&10 %
Wrought Shutter, Sargent's list....dis 60&10 %
Wrought Sunk Flush, Sargent's list....dis 55&10 %
Wrought Sunk Flush, Stanley's list....dis 40&10&5 %
Wrought B. K. Flush, Com'n Stanley's list. dis 55&10 %
Carriage—
Com. list June 10, '84....dis 75&12½&2 %
Genuine Eagle, list Oct., '84....dis 75 @ 75&5 %
Phila. pattern, list Oct. 7, '84...dis 75&10@75&10&5 %
R. B. & W., old list....dis 70&5 %
Tire—
Common, list Feb. 28, 1883....dis 65&10 %
P. C. B. & N. Co., Empire, list Feb. 28, 1883. dis 65&10 %
P.C.B.&N.Co., Keystone, Phil. list, Oct. '84...dis 82½ %
P.C.B.&N.Co., Norway, Phil. list, Oct. '84....dis 80 %
Am. S. Co., Norway, Phil., list Oct. 16, '84....dis 80 %
Am. S. Co., Eagle, Phil., list Oct. 16, '84....dis 82½ %
Am. S. Co., Philadel. list, Oct. 16, '84....dis 82½&5 %
Am. S. Co., Bay State, list Feb. 28, '83....dis 65&10 %
R. B. & W., Philadel. list Oct. 16, 1884....dis 80&5 %
R. & E. Mfg. Co....dis 65&10 %
Stove and Plow—
Stove....dis 70 %
Plow....dis 65 %
Am. S. Co. Stove, Annealed....dis 70 %
R. B. & W., Plow....dis 50&5 %
R. B. & W., Stove....dis 70&5 %
Machine....dis 75&15 @ 80 %
Bolt Ends....dis 75&15 @ 80 %

Borax....₱ lb 8½¢ @ 8¾¢

Boring Machines.

Without Augers.	Upright.	Angular.	
Douglas	$5.50	$6.75	dis 50 %
Snell's, Rice's Patent	5.50	6.75	dis 40&10&10 %
Jennings	5.50	6.75	dis 45@45&10 %
Other Machines	2.35	2.75	net
Phillips' Pat., with Augers	7.00	7.50	net

Bow Pins
Humason, Beckley & Co.'s, Nos 1 and 2—dis 60&10 @ 60&10&5 %
Humason, Beckley & Co.'s other Nos..dis 70 @ 70&10 %
Sargent & Co.'s....$17 and $18, dis 60&10 %
Peck Stow & W. Co....dis 50&10 @ 50&10&5 %

Braces.
Backus, Nos. 110 to 114 and 31 to 33..dis 60&5@60&10 %
Backus, Nos. 6, 8, 12, 14....dis 60&10&5 %
Backus, Nos. 16, 18, 20, 29, 7, 9, 11....dis 70&10&5 %
Barber's, Nos. 10 to 16....dis 50 %
Barber's, Nos. 30 to 33....dis 50 %
Barber's, Nos. 40 to 63....dis 50&10 %
Spofford's....dis 50&10 %
Ives' New Haven....dis 70 @ 70&5 %
Ives' Novelty....dis 6 &5 @ 60&10 %
Ives' Novelty, Improved....dis 60&5 @ 60&10 %
Ives' Spofford....dis 60 @ 60&5 %
Common Ball, American....$1.10 @ $1.15
Bartholomew's, Nos. 25, 27, 30..dis 50&10@50&10&10 %
Bartholomew's, Nos. 117, 118, 119....dis 65 @ 65&5 %
Amidon's Barker's Imp'd....dis 60&10&5 %
Amidon's Ratchet....dis 70 @ 70&5 %
Amidon's Corner Brace....dis 40 @ 40&10 %
Amidon's Universal....8 in., $1.90; 10 in., $2.10
Amidon's Buffalo Ball....$1.10 @ $1.15
P. S. & W....dis 50&10 %

Brackets.
Shelf, plain, Sargent's list....dis 55&10 @ 55&10&10 %
Shelf, fancy, Sargent's list....dis 60&10 @ 60&10&10 %
Reading, plain....dis 60&10 @ 60&10&10 %
Reading, Rosette....dis 65&10 @ 65&10&10 %

Bright Wire Goods.
Regular list....dis 75&10 %

Broilers.

Henis' Self-Basting..	Inch....	9	10	9 x 11
	Per doz....	$4.50	5.50	6.50

Buckets.—See Well Buckets and Pails.

Bull Rings.
Union Nut Co....dis 55 %
Sargent's....dis 66⅔&10 %
Hotchkiss' low list....dis 30 %
Humason, Beckley & Co.'s....dis 70&10 %
Peck, Stow & W. Co.'s....dis 50&10 %
Ellrich Hdw. Co., White Metal, low list....dis 50 %

Butts.
Brass—
Wrought Brass....dis 80 @ 80&10 %
Cast Brass, Tiebout's....dis 40 %
Cast Brass, Corbin's F. Joint....dis 33⅓&10@33⅓&10&10 %
Cast Brass, Loose Joint....dis 33⅓&10@33⅓&10&10 %
Cast Iron—
Fast Joint, Narrow....dis 60&5 @ 60&10&5 %
Fast Joint, Broad....dis 60&5 @ 60&10&5 %
Loose Joint } dis 70&10@70&10&5 %
Loose Joint, Japanned } dis 70&10@70&10&5 %
Loose Joint, Jap. with Acorns } dis 70&10@70&10&5 %
Parliament Butts } dis 70&10@70&10&5 %
Mayer's Hinges } dis 70&10@70&10&5 %
Loose Pin, Acorns } dis 70&10@70&10&5 %
Loose Pin, Acorns, Japanned } dis 70&10@70&10&5 %
Loose Pin, Acorns, Jap, Pltd. Tips } dis 70&10@70&10&5 %
Wrought Iron—
Fast Joint Narrow....dis 65&2 %
Fast Joint, Lt. Narrow....dis 65&2 %
Fast Joint, Broad....dis 65&2 %
Loose Joint, Broad....dis 65&5&2 %
Table Butts, Back Flaps, &c....dis 65&2 %
Inside Blind, Regular....dis 65&2 %
Inside Blind, Light....dis 65&2 %
Loose Pin, Wrt....dis 65&5&2 %
Loose Pin, Light....dis 65&2 %
Bronzed Wrought Butts....dis 40&2 %
Blind Butts—
Parker....dis 75&2 %
Palmer....dis 50&5&10 %
Seymour....dis 70&2 %
Lull & Porter....dis 80 %
Nicholson....dis 45&10 %
Buffer....dis 50 %
Clark's, Nos. 1, 3, 5....dis 80&5 @ 80&10 %
Sargent's, Nos. 1, 3, 5, 11, 13....dis 75&10 %
Sargent's, No. 12....dis 75&10&10 %
Reading's Gravity....dis 75&10 %
Shepard's "Noiseless," Nos. 50, 60, 65, 45 and 55....dis 75&10 @ 75&10&5 %
Shepard's Niagara Gravity, Nos 1, 3 and 5....dis 80 %
Shepard's Buffalo Gravity, Nos. 1, 3 & 5..dis 80&2½ %
Shepard's Champion Gravity, No. 7½....dis 80&10 %
Shepard's "O. S." and "Acme" Lull & Porter....dis 75&10&5 %
Shepard's "Queen City" Reversible....dis 75&10 %
Clark's Improved Shutter Hinge, Nos. 0, 1, 1½, 2, 2½, 3....dis 70 @ 70&5 %
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50....dis 25&2 %

Butcher's Cleavers.
Humason & Beckley Mfg. Co....dis 30&5 @ 30&10 %
Bradley's....dis 25 @ 30 %
Beatty's....dis 33⅓&5 %

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

New Haven Edge Tool Co.'s....dis 40 %
Albertson Mfg. Co....dis 33⅓ @ 33⅓&5 %

Calipers.—See Compasses.

Can Openers.
Messenger's Comet....₱ doz $3.00, dis 25 %
American....₱ gross $3.00
Duplex....₱ doz 25¢, dis 15 @ 20 %
Lyman's....₱ doz $3.75, dis 20 %
No. 4, French....₱ doz $2.25, dis 55 @ 60 %
No. 5, Iron handle....₱ gross $6.00, dis 45 @ 50 %
Eureka....₱ doz $2.50, dis 10 %
Sardine Scissors....₱ doz $7.00, dis 55 %
Star....₱ doz $5.00, dis 25&5 %
Sprague, No. 1, $2; 2, $2.25; 3, $2.50....dis 50&10&10 %
World's Best, ₱ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00....dis 50&10 %
Universal....₱ doz $3.00, dis 35&5 %
Domestic....₱ doz $2.50, dis 45 %
Champion....₱ doz $2.00, dis 50 %

Cards.
Horse and Curry....dis 10 @ 10&10 %
Cotton....New list, Aug., 1883, dis 10 %
Wool.... " " " dis 10 %

Carpet Stretchers.
Cast Steel, Polished....₱ doz $3.25
Cast Iron, Steel Points....₱ doz 80¢
Socket....₱ doz $1.75
Bullard's....dis 25 @ 25&10 %

Carpet Sweepers.
Bissell No. 5....₱ doz $17.00
Bissell No. 7 New Drop Pan....₱ doz $19.00
Bissell No. 12 Hall Sweeper....₱ doz $36 00
Grand Rapids....₱ doz $27.00
Crown Jewel....No. 1, $18; No. 2, $19; No. 3, $20
Magic....₱ doz $15.00
Jewel....₱ doz $17.00
Mystic....₱ doz $17.00
Cottage....₱ doz $15.00
Garland....₱ doz $19.00
Queen....₱ doz $16.00
Queen, with band....₱ doz $18.00
King....₱ doz $30.00
Weed Improved....₱ doz $18.00
Hub....₱ doz $16.00
Cog Wheel....₱ doz $16.00
Church....each $3.00

Cartridges.—See Ammunition.

Casters.
Bed } New list July 8, 1886 dis 50&10 @ 50&10&5 %
Plate } New list July 8, 1886 dis 50&10 @ 50&10&5 %
Shallow Socket } New list July 8, 1886 dis 50&10 @ 50&10&5 %
Deep Socket....40&10 %
Yale Casters, list May, 1884....dis 25&10@25&10&5 %
Yale, Gem....dis 60@60&5 %
Martin's Patent (Phœnix)....dis 45&10 @ 50 %
Payson's Anti friction....dis 60 %
"Giant" Truck Casters....dis 10 @ 10&5 %
Stationary Truck Casters....dis 45&10

Cattle Leaders.
Humason, Beckley & Co.'s....dis 75 %
Sargent's....dis 66⅔&10 %
Hotchkiss....dis 30 %
Peck, Stow & W. Co....dis 50&10 %

Chain.
Trace, 6½-10-2, Eng. sizes....₱ pair 79¢ } dis 50&10 @ 60 %
Trace, 6½-10-3, Eng. sizes....₱ pair 70¢ } dis 50&10 @ 60 %
Trace, 7-10-2, Eng. sizes....₱ pair 86¢ } dis 50&10 @ 60 %
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1 1884....dis 50&10 @ 60 %

American Coil	3-16	¼	5-16	⅜	7-16	½	⅝	¾
In cask lots.	8¢	5.2¢	4.3¢	3.7¢	3.6¢	3.45¢	3.3¢	3.25¢

American Coil, less than cask lots, add ½¢ ₱ lb.
German Coil, list of June, 1881....dis 55&5@60 %
German Halter Chain, list of June, 1884. dis 55&5@60 %
Covert Halter, Hitching and Breast....dis 50&2 %
Covert Traces....dis 40&2 %
Oneida Halter Chain (old list)....dis 45 %
Galvanized Pump Chain....₱ lb 5½¢ @ 6¢
Jack Chain, Iron....dis 75&10 @ 75&10&5 %
Jack Chain, Brass....dis 75 @ 75&10 %

Chalk.
White....₱ gro 55¢
Red....₱ gro 75¢
Blue....₱ gro 90¢
White Crayons....₱ gro 12¢ @ 12½¢

Chalk Lines.—See Lines.

Cherry Seeders....₱ doz $3

Chisels.
Socket Framing and Firmer—
Witherby and Douglas } dis 75 @ 75&5 %
P., S. & W. } dis 75 @ 75&5 %
New Haven and Middlesex } dis 75 @ 75&5 %
Buck Bros....dis 30 %
Merrill....dis 60&10&10 %
L. & I. J. White....dis 30 @ 30&5 %
Tanged Firmers....dis 50 @ 50&5 %
Tanged Firmers, Butcher's....$4.75 @ $5.00
Tanged Firmers, Spear & Jackson's....$5.00 to £
Tanged Firmers, Buck Bros....dis 30 %

Chucks.
Morse's Beach Patent....each, $8.00, dis 20 %
Morse's Adjustable....each, $7.00, dis 20 @ 20&5 %
Danbury....each, $6.00, dis 30 @ 30&5 %
Syracuse, Balz Pat....dis 25 %

Clamps.
Providence Tool Co.'s Wrought Iron....dis 25 %
Adjustable, Gray's....dis 20 %
Adjustable, Lambert's....dis 20 %
Adjustable, Snow's....dis 40&5 %
Adjustable, Hammer's....dis 15 %
Adjustable, Stearns'....dis 20&10 %
Cabinet, Sargent's....dis 66⅔&10 %
Carriage Makers', Sargent's....dis 66⅔&10 %
Eberhard Mfg. Co....dis 40&5 @ 40&10 %
Warner's....dis 40&10 %
Saw Clamps....See Vises

Clips.
Axle and Spring Bar, Norway Iron....dis 65&2 %
Common Axle Clips....dis 70 %
Wrought-Iron Felloe Clips....₱ lb 5½¢
Steel Felloe Clips....₱ lb 5¢

Cockeyes.....dis 50 %

Cocks, Brass.
Hardware list....dis 55&10&2 %

Coffee Mills.
Board and Box....dis 45&10&2 %
Selsor's Patent....$9.50, $10.50, dis 25 %
American, Enterprise Mfg. Co....dis 20&10@30 %
The "Swift," Lane Bros....dis 20&10 %
Webb's Patent....dis 45 %

Compasses, Dividers, &c.
Compasses, Calipers, Dividers....dis 70@70&10 %
Bemis & Call Co.'s Dividers....dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers....dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside. dis 50&5 %
Bemis & Call Co.'s Double....dis 60 %
Bemis & Call Co.'s (Call's Patent Inside)....dis 30 %
Excelsior....dis 50 %
Cook's Extension....dis 20 @ 20&5 %
J. Stevens & Co.'s Calipers and Dividers....dis 25&10 %

Coopers' Tools.
Bradley's....dis 20 %
Barton's....dis 20@20&5 %
L. & I. J. White....dis 20&5 %
Albertson Mfg. Co....dis 25 %
Beatty's....dis 33⅓ @ 40 %
Sandusky Tool Co....dis 30 @ 30&5 %

Corkscrews.
Humason & Beckley Mfg. Co....dis 40 @ 40&10 %
Clough's Patent....dis 33⅓ @ 33⅓&5 %
Howe Bros. & Hulbert....dis 35 %

Corn Knives and Cutters.
Bradley's....dis 10 %
Wadsworth's....dis 25 %

Cradles.
Grain....dis 40&5&2 %

Crow Bars.
Cast Steel....₱ lb 3½¢
Iron, Steel Points....₱ lb 3¼ @ 3½¢

Curry Combs.
Fitch's....dis 50&10 @ 50&10&10 %
Rubber....₱ doz $10.00, dis 25 @ 30 %
Perfect....dis 50 %

Curtain Pins.
Silvered Glass....net
White Enamel....net

Cutlery.
Beaver Falls and Booth's....dis 33⅓ %
Wostenholme....$7.75 @ $8.00 to £

Dividers.—See Compasses.

Dog Collars.
Embossed Gilt, Pope & Stevens' list....dis 30&10 %
Leather, Pope & Stevens' list....dis 40 %
Brass, Pope & Stevens' list....dis 40 %

Door Springs.
Torrey's Rod, regular size....₱ doz $1.30
Gray's....₱ gro, $20.00, dis 20 %
Bee Rod....₱ gro, $20.00, dis 20 %
Warner's No. 1, ₱ doz. $2.50; No. 2, $3.30, dis 40&10@50 %
Gem (Coil), list April 19, 1886....dis 10 %
Star (Coil), list April 19, 1886....dis 20 %
Victor (Coil)....dis 60 @ 60&10 %
Champion (Coil)....dis 60&10 @ 60&10&10 %
Philadelphia....5 in., $5.00; 8 in., $7.75, dis 50 %
Cowell's....No. 1, ₱ doz $18.00; No. 2, $15.00, dis 50 %
Rubber, complete....₱ doz $4.50, dis 55&10 %
Hercules....dis 50 %
Shaw Door Check and Spring....dis 25 @ 30 @ 35 %
Elliott's Door Check and Spring....dis 25 %

Drawing Knives.
Witherby and Douglas } dis 75 @ 75&5 %
P., S. & W. } dis 75 @ 75&5 %
New Haven and Middlesex } dis 75 @ 75&5 %
Merrill....dis 60&10&10 %
Watrous....dis 15&10 @ 25 %
L. & I. J. White....dis 20&5 %
Bradley's....dis 35 %
Adjustable Handle....dis 20 @ 25 %
Wilkinson's Folding....dis 25 @ 25&5 %

Drills and Drill Stocks.
Blacksmiths'....each, $1.50 @ $1.60
Blacksmiths' Self-Feeding....each, $7.50, dis 20 %
Breast, P. S. & W....dis 40&10 %
Breast, Wilson's....dis 30&5 %
Breast, Millers Falls....each, $3.00 dis 25 %
Breast, Bartholomew's....each, $2.50, dis 25&10 @ 40 %
Ratchet, Merrill's....dis 20 %
Ratchet, Ingersoll's....dis 25 %
Ratchet, Parker's....dis 20 @ 20&5 %
Ratchet, Whitney's....dis 20&10 %
Ratchet, Weston's....dis 20@25 %
Ratchet, Moore's Triple Action....dis 25 @ 30 %
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00....dis 20&10 %
Wilson's Drill Stocks....dis 10 %
Automatic Boring Tools....each, $1.75 @ $1.85
Twist Drills—
Morse....dis 50&10 %
Standard....dis 50&10 %
Syracuse....dis 50&10 %
Cleveland....dis 50&10 %
Williams....dis 50&10&10 %

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans.
Per lb....5¢ @ 5½¢

Egg Beaters.
Dover....₱ doz., $2.50
National....₱ doz $4.50, dis 33⅓ %
Family (T. & S. Mfg. Co.)....₱ gro, $17.00@$18.00
Standard (Standard Co.)....₱ gro, $10.00
Kingston (Standard Co.)....₱ gro, $7.50
Acme (Standard Co.)....₱ gro, $7.00
Duplex (Standard Co.)....₱ gro, $12.00
Rapid (Standard Co.)....₱ gro, $15.00
Triumph (T. & S. Mfg. Co.)....₱ gro, $10.50@$11.50
Advance No. 1....₱ gro $10.50
Advance, No. 2....₱ gro $10.00
Bryant's....₱ doz $2.00
Ayres' Spiral....₱ gro $5

Electric Bell Sets.—Wollensak's....dis 20 %

Emery.

	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF, F, FF.
Kegs, ₱ lb	4 ¢	4 ¢	2½¢
½ kegs, ₱ lb	4¼¢	4¼¢	2¾¢
¼ kegs, ₱ lb	4½¢	5 ¢	3½¢
10-lb cans, ₱ lb	7 ¢	7 ¢	5 ¢

Enameled and Tinned Ware.—See Hollow-Ware.

Escutcheon Pins.
Iron and Brass, list Nov 11, 1885. dis 50&10 @ 50&10&5 %

Escutcheons.
Door Lock....Same discounts as Door Locks
Brass Thread....dis 60 @ 60&10 %
Wood....dis 25 %

Faucets.
Fenn's....dis 40 %
Bohren's Patent Rubber Ball....dis 25 %
Fenn's Cork Stops....dis 33⅓ %
Star....dis 60 @ 60&5 %
Frary's Patent Petroleum....dis 40&10&2 %
West's Patent Key....dis 50 %
Anchor Lock....dis 45 %
Metallic Key, Leather Lined....dis 55&10 @ 60&10 %
Cork Lined....dis 70 @ 70&10 %
J. Sommer's Best Block Tin Key....dis 40 %
J. Sommer's Cork Lined, 1st quality....dis 50 %
J. Sommer's Diamond Lock....dis 40 %
Self-Measuring, Enterprise....₱ doz $36.00—dis 20&10 %
Self-Measuring, Lane's....₱ doz $36.00—dis 25&10 %
Self-Measuring, Victor....₱ doz $36.00—dis 25&10 %

Felloe Plates....₱ lb 6 @ 6½¢

Files.
Domestic—
Best brands....dis 60&5 @ 60&10 %
Good brands....dis 60&10 @ 60&10&5 %
Fair brands....dis 60&10&10 @ 70 %
Heller's Horse Rasps....dis 50&10 %
Imported—
J. & Riley Carr....List, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps....dis 10 %
Moss & Gamble....List April 1, 1883, dis 15 %
Butcher....Butcher's list, dis 20 %
Stubs....Stubs list, dis 25 @ 30 %

Fluting Machines.
Knox, 4½-inch Rolls....$3.25 each } dis 35 %
Knox, 6-inch Rolls....$3.60 each } dis 35 %
Eagle, 3½-inch Roll....$2.15, dis 35 %
Eagle, 5½-inch Roll....2.85, dis 35 %
Crown, 4½ in., $3.50; 6-in, $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel....6-in., $3.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter....$1.50 each, net
Geneva Hand Fluter, White Metal..₱ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10, dis 30 %
Shepard Hand Fluter, No. 85....₱ doz $15.30, dis 40 %
Shepard Hand Fluter, No. 110....₱ doz $11, dis 40 %
Shepard Hand Fluter, No. 95....₱ doz $8, dis 40 %
Clark's Hand Fluter....₱ doz $15.00, dis 33⅓ %
Combined Fluter and Sad Iron...₱ doz $15.00, dis 30 %
Buffalo....₱ doz $10.00, dis 10 %

Fluting Scissors....dis 45 %

Fly Traps.—Paragon....₱ doz $2
Balloon....₱ doz $1.75

Forks.—Hay, Manure, &c., Asso. list. dis 60&10&10 %
Hay, Manure, &c., Phila. list....dis 60 @ 60&5 %
Plated, see Spoons.

Freezers, Ice-Cream.
Leading Goods....dis 60&2 @ 60&5 %

Fruit and Jelly Presses.
Enterprise Mfg. Co....dis 20&10 @ 33⅓ %
Henis....₱ gross $45, ₱ doz $4 @ $4.50

Fry Pans.
Central Stamping Co.'s list....dis 33⅓&2 @ —%

No.	0	1	2	3	4	5	6	7	8
₱ doz.	$1.50	1.75	2.00	2.25	2.50	2.75	3.25	3.75	4.25

Sidney Shepard & Co....dis 40&2 %
Acme....dis 60 %
Iron Clad Mfg. Co.'s list....dis 70 %

No.	0	1	2	3	4	5	6	7	8
₱ doz.	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00

Gauges.
Marking....dis 60&10 %
Wire, low list....dis 10&10 %
Wire, Wheeler, Madden & Co....dis 10 %
Wire, Morse's....dis 50 @ 50&5 %
Wire, Brown & Sharpe's....dis 10 @ 20 %

Gimlets.
Nail and Spike....dis 50&10&5 %
"Eureka" Gimlets....dis 40&10 %
"Diamond" Gimlets....dis 40&10 %
Double Cut, Shepardson's....dis 45 %
Double Cut, Ives'....dis 50&10 @ 60 %
Double Cut, Douglass'....dis 40 %
"Bee"....₱ gross $12, dis 25 %

Glue Pots.
Tinned and Enameled....dis 35@35&5 %
Family, Howe's "Eureka"....dis 40 %
Family, L. F. & C.'s "Handy"....dis 50 %

Grindstone Fixtures.
Sargent's Patent....dis 70&10 %
Reading Hardware Co....dis 33⅓&10 %

Hack Saws.—See Saws.

Halters.—Covert's Pat. ½ Jute....dis 50&10&2 %
Covert's Hemp Horse and Cattle Tie....dis 50&10&2 %
Covert's Jute Horse and Cattle Ties....dis 60&2 %
Meneely's Pat. Adjustable Hemp and Jute..dis 50&10 %
Meneely's Hemp and Jute Horse and Cattle Ties....dis 50&10 %

Hammers.
Maydole's....List Dec. 1, 1885, dis 25 @ 25&10 %
Cheney's, new list, March, 1883....dis 20&10 %
Hartford Hammer Co.'s Nail Ham's....dis 25&10@35 %
Buffalo Hammer Co....dis 30 @ 35 %
C. Hammond & Son....dis 40&10 @ 50 %
Humason & Beckley....dis 25 %
Verree....dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 and 1.75. dis 30&10 %
Nelson Tool Works....dis 40&10 %
Warner & Nobles....dis 10 %
Yerkes & Plumb, A. E. Nail
Peck, Stow & Wilcox....dis 40 %
Sargent's....dis 33⅓&10 %
Wilkinson's Smiths'....10½¢ @ 11¢ ₱ lb
Heavy Hammers and Sledges...dis 60&10 @ 60&10&5 %

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ₱ doz....dis 10 %
Providence Tool Co., Leg Irons, $25.00 ₱ doz....dis 10 %
Tower's....dis 25 %
Daley's Improved Hand Cuffs; 2 Hands, Polished, ₱ doz, $48; Nickeled, $57; 3 Hands, Polished, ₱ doz, $72; Nickeled, $84....dis 20 %

Handles.
Iron, Wrought or Cast.—
Door or Thumb.

Nos.	0	1	2	3	4	
Per doz.	$0.90	1.00	1.18	1.35	1.50	dis 60&10&10 %

Roggin's Latches....₱ doz. 30¢ @ 35¢
Bronze Iron Drop Latches....₱ doz. 70¢ net
Jap'd Store Door Handles—Nuts, $1.63; Plate, $1.10; no Plate, $0.88....net
Barn Door....₱ doz. $1.40, dis 10&10 %
Chest and Lifting....dis 70 %
Handles, Wood—
Saw and Plane....dis 40&10 @ 40&10&5 %
Hammer, Hatchet, Axe, Sledge, &c....dis 25 @ 30 %
Brad Awl....₱ gross $2.00
Hickory Firmer Chisel, assorted....₱ gross 4.50 } dis 40
Hickory Firmer Chisel, large....₱ gross 5.00 } dis 40
Apple Firmer Chisel, assorted....₱ gross 5.00 } dis 40
Apple Firmer Chisel, large....₱ gross 6.00 } dis 40
Socket Firmer Chisel, assorted....₱ gross 3.00 } dis 40
Socket Framing Chisel, assorted....₱ gross 5.00 } dis 40
J. B. Smith Co.'s Pat. File....dis 50 %
File, assorted....₱ gross 2.75 } dis 40 @ 40&10 %
Auger, assorted....₱ gross 5.00 } dis 40 @ 40&10 %
Auger, large....₱ gross 7.00 } dis 40 @ 40&10 %
Patent Auger, Ives'....dis 25 %
Patent Auger, Douglass'....₱ set $1.25 net
Patent Auger, Swan's....₱ set $1.00 net
Hoe, Rake, Shovel, &c....dis 50&10 %
Cross Cut Saw Handles—
Atkins' No. 1 Loop, ₱ pair, 30¢; No. 3, 22¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles....50¢, dis 60 %
Champion....15¢

Hangers.
Barn Door, old patterns....dis 60&10&10 @ 70 %
Barn Door, New England....dis 60&10&10 @ 70 %
Samson Steel Anti-Friction....dis 55 %
Orleans Steel....dis 55 %
Hamilton Wrought Wood Track....dis 55 %
U. S. Wood Track....dis 65 %
Champion....dis 60&10 %
Ritter and Wooster, Medina Mfg. Co.'s list....dis 70 %
Climax Anti-Friction....dis 55 %
Climax Steel Anti-Friction....dis 50 %
Zenith for Wood Track....dis 55 %
Reed's Steel Arm....dis 40 %
Challenge....dis 50 %
Sterling Improved (Anti-Friction)....dis 65&10 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18...dis 50&2 %
Cheritree....dis 50&5 %
Kidder's....dis 50&10 @ 50&15 %
The "Boss"....dis 60 %
Best Anti-Friction....dis 60 %
Duplex (Wood Track)....dis 60
Terry's Patent....₱ doz. pr., 3½ in. $10; 5 in., $12....dis 40&5@40&10
Cronk's Patent....No. 4, $12; No. 5, $14.40; No. 6, $18 ....dis 50&10 @ 50&15 %
Wood Track, Iron Clad..₱ ft. 10¢, dis 50&10 @ 50&15 %
Architect....₱ set $6.00, dis 20 %
Eclipse....dis 20&10
Felt's....₱ set $4.50, dis 20 %
Richards' (lots of 50 sets dis 20&10&10 %)..dis 20&10 %
Lane's Steel Anti-Friction....dis 30&10 %
The Ball Bearing Door Hanger....dis 20&10 @ 25&10 %
Warner's Patent....dis 20@20&10 %
Stearns' Anti-Friction....dis 20 @ 20&10 %
Faultless....dis 40 @ 40&5 %
American....₱ set $6; dis 20&10 %
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢....dis 40 %
Paragon, Nos. 1, 2 and 3....dis 50 %
Paragon, Nos. 4, 5, 5½ and 6....dis 25&5 %
Crescent....dis 60@60&10 %

Harness Snaps.
Anchor (T. & S. Mfg Co.)....dis 65 %
Henshaw's, list of 1⅛ changed to $14.00....dis 65 %
Judd's, list of 1⅛ changed to $14.00....dis 65 %
Fitch's (Bristol), list of 1⅛ changed to $14.00....dis 65 %
Hotchkiss....dis 10 %
Andrews....dis 50 %
Sargent's Patent Guarded....dis 70&10&10 %
German, old list....dis 75 %
German, Sargent's 1886 list....dis 50&10 %
Covert....dis 50&2 %
Covert, New Patent....dis 50&2 %
Covert New R. E....dis 60@2 %
Covered Spring....dis 66⅔&10 %

Hatchets.—List Jan. 1, 1886.
Isaiah Blood....dis 35 @ 40 %
Hunt's Shingling Lath and Claw....dis 40&5 %
Hunt's Broad....dis 40 %
Hurd's....dis 40&5 @ 40&10&5 %
Yerkes & Plumb
Underhill Edge Tool Co....dis 40&5 @ 40&10 %
C. Hammond & Son....dis 40&10 @ 50 %
Simmons....dis 35 @ 40 %
Peck's....dis 40&10 @ 40&10&5 %
Kelly's....dis 50@50&5 %
Sargent & Co....dis 50 %
Ten Eyck Edge Tool Co....dis 40&10@40&10&5 %
Collins, following list....dis 10 %

	Nos. 1 2 3				
Shingling,	Nos. 1 2 3	₱ doz	$5.50	$6.00	$6.50
Claw,	Nos. 1 2 3	₱ doz	6.00	6.50	7.00
Lathing	Nos. 1 2 3	₱ doz	5.50	6.00	6.50

Hay Knives.
Lightning....₱ doz $18 dis 20 %
Electric....₱ doz $9.50 @ $10.50
Gem....₱ doz $12.50 @ $13.50
Wadsworth's....dis 35&5 @ 40 %
Heath Patent....₱ doz $13 @ $13.50
Carter's Needle....₱ doz $18, dis 10&5 @ 10&10 %

Hinges.
Wrought Iron Hinges—
Strap and T....dis 65&5&2 %
Screw Hook and Strap { 8, 10, 12 in..₱ lb....3⅛@3⅜¢
Screw Hook and Strap { 14 to 36 in. ₱ lb....2⅞@2⅞¢
Heavy Welded Hook { 8 to 12 in., ₱ lb....3⅛@3⅜¢
Heavy Welded Hook { 14 in. & up, ₱ lb....2⅞@2⅞¢
Screw Hook and Eye { ½ in....₱ doz $1.50 } dis 10 %
Screw Hook and Eye { ⅝ in....₱ doz $2.45 } dis 10 %
Screw Hook and Eye { ¾ in....₱ doz $3.80 } dis 10 %
Rolled Blind Hinges, Nos. 32 and 34....dis 50&10 %
Rolled Blind Hinges, Nos. 232 and 234....dis 55&10 %
Rolled Plate....dis 70&10 %
Rolled Raised....dis 70&10 %
Plate Hinges { 8, 10 & 12 in., ₱ lb....4¼¢
"Providence" { over 12 in., ₱ lb....3¼¢
Spring Hinges—
Geer's Spring and Blank Butts....dis 40 %
Union Spring Hinge Co.'s list, March, 1886...dis 20 %
Acme, Crown, Empire and U. S....dis 30 %
American, Gem, and Star, Japanned....dis 20 %
American, Gem, and Star, Bronzed....net
Oxford, Bronze and Brass....net
Barker's Double Acting....dis 20&10 %
Union Mfg. Co....dis 25 %
Bommer's....dis 30 %
Buckman's....dis 25 %
Chicago....dis 30 %
Gate Hinges—
Western....₱ doz $4.40, dis 55 %
N. E....₱ doz $7.00, dis 55 %
N. E. Reversible....₱ doz $5.20, dis 55 %
Clark's, Nos. 1 2 3....dis 60&10&2 %
N. Y. State....₱ doz $5.00, dis 55 %
Automatic....₱ doz $12.50, dis 50 %
Common Sense....₱ doz pair $4.50, dis 50 %
Seymour's....dis 45&10 %
Shepard's, Nos. 1, 2, 10 and 20....dis 60&10&10 %
Shepard's, No. 3....dis 60&10&5 %
Reed's Latch and Hinges....₱ doz sets $12, dis 50 %

Hoes.
Handled—
Garden, Mortar, &c....dis 60&10&10 %
Planter's, Cotton, &c....dis 60&10&10 %
Warren Hoe....dis 60 %
Magic....₱ doz $4.75
Eye—
D. & H. Scovil....dis 15 %
Lane & Gale, S. & O. Pat....dis 50 @ 50&10 %
Maynard, " " ....dis 60 @ 60&5 %
Sandusky Tool Co., " " ....dis 60&10 %
Hubbard & Co., " ....dis 60&10 %
Grub....dis 60 @ 60&10 %

Hog Rings and Ringers.
Hill's Improved Ringers....₱ doz. $5.50 @ 5.75
Hill's Old Style Ringers....₱ doz $3.25 @ 3.50
Hill's Tongs....₱ doz, $5.50 @ 6.00
Hill's Rings....₱ doz boxes, $2.00 @ 2.25
Perfect Rings....₱ doz boxes $1.75 @ 2.00
Perfect Ringers....₱ doz $2.50
Blair's Hog Ringers....₱ doz, $2.60
Blair's Hog Rings....₱ doz, $1.10 @ 1.15
Champion Ringers....₱ doz $2.25
Champion Rings, Double....₱ doz $2.25
Brown's Ringers....₱ doz, $2.25
Brown's Rings....₱ doz, $1.25 @ 1.35

Hoisting Apparatus.
"Moore's" Hand Hoist, with Lock Brake....dis 15 %
"Moore's" Differential Pulley Block....dis 20 %

Holders, Tool.
Balz Pat....₱ doz $4; dis 25 %

Hollow-Ware.
Iron—
Stove Hollow-Ware, Ground....dis 50&10@50&10&5 %
Stove Hollow-Ware, Unground....dis 60&5@60&10 %
Enameled and Tinned Hollow-Ware—
Kettles....dis 50&10 %
Oval Boilers, Saucepans and Glue Pots dis 30 @ 35 %
Gray Enameled Ware....dis 10 @ 40&5 %
Agate and Granite Ware....dis 25 %
Rustless Hollow-Ware....dis 50 @ 50&5 %
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each	55¢	60¢	65¢	75¢

Silver Plated—
Reed & Barton....dis 40 %
Meriden Brittania Co....dis 40 %
Simpson, Hall, Miller & Co....dis 40 %
Rogers & Brother....dis 40 %
Harford Silver Plate Co....dis 50 %
William Rogers Mfg. Co....dis 50 %

Hooks.
Cast Iron—
Bird Cage, Sargent's list....dis 60&10&10 %
Bird Cage, Reading....dis 60&10&10 %
Clothes Line, Sargent's list....dis 60&10 %
Clothes Line, Reading list....dis 66⅔&10 %
Ceiling, Sargent's list....dis 55&10 %
Harness, Reading list....dis 60&10&10 %
Coat and Hat, Sargent's list....dis 55&10 %
Coat and Hat, Reading....dis 60&10 %
Wrought Iron—
Cotton....₱ doz $1.25
Cotton Pat. (N. Y. Mallet & Handle W'ks)....dis 30 %
Tassel and Picture (T. & S. Mfg. Co.)....dis 50 %
Wrought Staples, Hooks, &c....See Wrought Goods
Bench Hooks....See Bench Stops
Wire—
Wire Coat and Hat, Gem, list April, 1886....dis 45 %
Wire Coat and Hat, Miles', list April, 1886....dis 45 %
Belt....dis 80 @ 80&5 %
Wire Screw Hooks and Eyes..See Bright Wire Goods
Grass....₱ doz $2.00
Bush....dis 55 @ 60 %
Whiffletree—Patent....dis 55 %
Hooks and Eyes—Malleable Iron....dis 70 %
Hooks and Eyes—Brass....dis 60&10 %
Fish Hooks, American....dis 40&10 %

Horse Nails.

		Nos. 5	6	7	8	9	10	
Ausable	₱ lb	31¢	28¢	26¢	25¢	24¢	23¢	dis 25&10 %
Clinton, Pl'n.	₱ lb		23¢	21¢	20¢	19¢	18¢	dis 25&10 %
Clinton, Fin.	₱ lb		24¢	22¢	21¢	20¢	19¢	dis 25&10 %
Essex	₱ lb	31¢	28¢	26¢	25¢	24¢	23¢	dis 40 %
Putnam	₱ lb	27¢	24¢	22¢	21¢	20¢	19¢	dis 5&7 %
Vulcan	₱ lb	26¢	23¢	21¢	20¢	19¢	18¢	dis 12½ %
Northwest'n.	₱ lb	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&10 %
Globe	₱ lb	26¢	23¢	21¢	20¢	19¢	18¢	dis 10&5&5 %
A. C.	₱ lb	28¢	25¢	23¢	22¢	21¢	20¢	dis 25&5 %
C. B.-K.	₱ lb	28¢	25¢	23¢	22¢	21¢	20¢	dis 25 %
Champlain	₱ lb	31¢	28¢	26¢	25¢	24¢	23¢	dis 25&10 %
New Haven	₱ lb	31¢	28¢	26¢	25¢	24¢	23¢	dis 25&10 %
Bridgewater	₱ lb	28¢	25¢	23¢	22¢	21¢	20¢	dis 30 %
Saranac	₱ lb	26¢	23¢	21¢	20¢	19¢	18¢	dis 25 @ 30 %
Champion	₱ lb	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&10&5 %
Capewell	₱ lb	31¢	28¢	26¢	25¢	24¢	23¢	dis 35&5 %
Star	₱ lb	26¢	23¢	21¢	20¢	19¢	18¢	dis 10&10 %

NOTE.—Concessions on above quotations are frequently made.

Horse Shoes.—See Shoes, Horse.

Hose, Rubber.....75&10 @ 75&10&5 %
N. Y. B. & P. Co., Standard....dis 60 @ 60&10 %

Ice Picks, Chisels, &c.
American Ice Chisel Pol'd....₱ doz $3.00, dis 20 %
National Ice Chisel....₱ doz $6.25, dis 20 %
Novelty Ice Breakers....₱ doz $6.25, dis 20 %
White's Sliding Head Picks....₱ doz $2.50, dis 40 %
Dunlap's Ring Picks....₱ doz $2.00, dis 15 %
Wood Head Picks, Sargent's....₱ doz $1.60, dis 50&10 %
Iron Head Picks, Sargent's....₱ doz $1.25, dis 50&10 %
Ice Mallets, Pick in handle....₱ doz $2.00, dis 15 %
Ice Axes, Small Cast or Mall...₱ doz $1.25, dis 20&10 %
Combination Ice Tools....₱ doz $2.00 net
Acme Ice Pick and Tongs....₱ gross $55.00, dis 50&10 %
Roger's Lightning Ice Chisel....₱ gross $28.50

Ice Cream Freezers.—See Freezers.

Ice Tongs.
Champion, S. S. & Co....₱ doz $4.00, dis 25&10 %
Family....₱ doz $2.75, dis 20@25 %

Jack Screws.—See Screws.

Kettles.
Brass, 7 to 17 in. inclusive....₱ lb 22¢ net
Brass larger than 17 inches....₱ lb 24¢ net
Enameled and Tea Kettles....See Hollow-Ware

Keys.
Lock Asso'n list Dec. 18, 1885....dis 45&2@45&7½&2
Eagle, Cabinet, Trunk and Padlock....dis 40&2
Hotchkiss' Brass Blanks....dis 40 %
Hotchkiss' Copper and Tinned....dis 40 %
Hotchkiss' Padlock and Cabinet....dis 35 %
Ratchet Bed Keys....₱ doz $4.00, dis 15 %

Knife Sharpeners.
Parkin's Applewood Handles....₱ doz $6.00, dis 40 %
Parkin's Rosewood or Cocobolo...₱ doz $9.00, dis 40 %

Knives.
Wilson's Butcher Knives....dis 25 @ 30 %
Ames' Butcher Knives....dis 25 %
Nichols' Butcher Knives....dis 40&10 %
Ames' Shoe Knives....dis 20@25 %
Ames' Bread Knives....₱ doz $1.50, dis 15 @ 20 %
Moran's Shoe and Bread Knives....dis 20 %
Goodell Co., Butcher, Shoe Bread, &c....dis 40 %
Hay and Straw....See Hay Knives
Table and Pocket....See Cutlery

Knobs.
Door Mineral....65@68¢
Door Por. Jap'd....75@80¢
Door Por. Por....$2.75 @ $3.00
Door Por. Plated....$2.50 @ $2.75
Hemacite Door Knobs, new list....dis 35&10 %
Yale & Towne Wood Knobs, list Dec. 1885....dis 40 %
Furniture Plain....75¢ gross (non dis 10 %)
Furniture, Wood Screws....dis 25&10 %
Base, Rubber Tip....dis 70&10&5 %
Picture, Judd's....dis 60&10&10 %
Picture, Sargent's....dis 66⅔&10 %
Picture, Hemacite....dis 35&5 %
Shutter, Porcelain....dis 65&10 %
Carriage, Japanned....₱ gross 80¢, dis 60&10 %

Ladles.
Melting, Sargent's....dis 55&10 %
Melting, Reading....dis 35&10 %
Melting, Monroe's Patent....₱ doz. $4.00, dis 40 %
Melting, P. S. & W....dis 35&10 @ 40 %
Melting, Warner's....dis 30 %

Lanterns.
Tubular, Standard No. 0, ₱ doz....$6.75 @ $7.00
Tubular, Standard No. 1, ₱ doz....8.25 @ 8.50
Tubular, Lift Wire, No. 0, ₱ doz....8.50
Tubular, Lift Wire, No. 1, ₱ doz....10.00
Guards for Tubulars, add ₱ doz....25
Police, Small, $6.00; Med., $7.25; Large, $9.75, dis 10@15 %
Porter's Tin R. R....$10 dis 20 %
Owl....$9 dis 20@25 %

Lawn Mowers.
Standard Machines....dis 50&5 %
Cheaper Machines....dis 50&10 @ 60 %
Lemon Squeezers.
Porcelain Lined, No. 1....₩ doz. $6.00, dis 25&30 %
Wood, No. 2....₩ doz. $3.00, dis 35 %
Wood, Common....₩ doz $1.70 @ 1.75
Dunlap's Improved....₩ doz. $3.75, dis 20 %
Sammis'....No. 1, $5; 2, $9; 12, $18 ₩ doz. dis 25&10 %
Jennings' "Star"....₩ doz $2.50
The "Boss"....₩ doz $2.50
Dean's....Nos. 1, ₩ doz $6.50; 2, $3.35; 3, $1.90
Little Giant....dis 50 @ 50&5 %
King....dis 40&5 %
Lines.
Cotton and Linen Fish, Draper's....dis 50 %
Draper's Chalk....dis 60 %
Draper's Mason's Linen, 84 ft., No. 1, $1.20; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25..dis 25 %
Cotton Chalk....dis 55 %
Silver Lake, Braided, Nos. 0, $6.00 No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gross....dis 25 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50
Masons' Colored Cotton....dis 45
Wire Clothes, No. 18, $3.75; No 19, $3 25; No. 20, $2.75.
Ventilator Cord, Samson Braided, White or Drab Cotton....$7.50 ₩ doz. dis 20%
Locks, Padlocks, Cabinet Locks, &c.
Door Locks, Latches, &c.—
List, Dec. 18, 1885....dis 45&2 @ 45&10&2 %
Nimick & Brittan's Burglar-Proof Locks.. dis 45&2 %
Reading Hardware Co. (list Feb. 2 1885)....dis 70 %
Perkins' Burglar Proof....dis 60&25 %
Plate....dis 33⅓&2 %
F. Many's "Extension Cylinder"....$10.50 ₩ doz net
Barnes Mfg. Co....dis 40 %
Yale Flat Key....dis 40 %
Dietz Flat Key....dis 30 %
L. & C. Round Key Latches....dis 0&10 %
L. & C. Flat Key Latches....dis 33⅓&10 %
Romer's Night Latches....dis 20 %
Yale new list....dis 40 %
"Shepardson" or "U. S."....dis 35 %
"Felter" or "American"....dis 40&10 %
Seed's N. Y. Hasp Lock....dis 25 %
Cabinet—
Eagle, Gaylord Parker and Corbin....} List March, '84, revised Jan. 1, '85....dis 40&2
Deitz, Nos. 36 to 39....dis 40 %
Deitz, Nos. 51 to 63....dis 40 &10 %
Dietz, Nos. 86 to 96....dis 30 %
Stoddard Lock Co....dis 30 %
"Champion" Night Latches....dis 40 %
Yale....dis 40 %
Barnes Mfg. Co....dis 40 %
Eagle and Corbin Trunk....dis 25&2 %
"Champion" Cabinet and Combination....dis 33⅓ %
Romer's....dis 25 %
Padlocks—
Russell & Erwin / Mallory, Wheeler & Co. / Nimick & Brittan Mfg. Co. / Wm. Wilcox & Co. / Norwich Lock Co. } List Dec. 23, 1884. Dis 70&10@70&10&10 %
Yale Lock Mfg. Co.'s....dis 40 %
Eagle....dis 25&2 %
Eureka, Eagle Lock Co....dis 40&2 %
Romer's, Nos. 0 to 91....dis 35 %
Romer's, Nos. 200 to 505....dis 20 %
A. E. Dietz....dis 40 %
"Champion" Padlocks....dis 33⅓ %
Hotchkiss....dis 30 %
"Star"....dis 15 %
"Horse Shoe," ₩ doz.. $9....dis 40 %
Barnes Mfg. Co....dis 40 %
Nock's....dis 30 %
Brown's Patent....dis 25 %
Scandinavian....dis 90 %
Fraim's Pat. Scandinavian, new list (low)....dis 60 %
Lumber Tools.
Ring Peavies, "Blue Line" Finish....₩ doz $20.00
Ring Peaves, Common Finish....₩ doz $18.00
Steel Socket Peavies....₩ doz $21.00
Mall. Iron Socket Peavies....₩ doz $19.00
Cant Hooks, "Blue Line" Finish....₩ doz $16.00
Cant Hooks, Common Finish....₩ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish....₩ doz $16.00
Cant Hooks, Mall. Socket Clasp Common Finish....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Fin. ₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish..₩ doz $12.00
Hand Spikes....₩ doz 6 ft., $15.00; 8 ft., $20

	12 ft.	14 ft.	16 ft	18 ft.	20 ft.
Pike Poles, Pike & Hook, ₩ doz.	$11.50	12.50	14.50	17.50	21.50
Pike Poles, Pike only, ₩ doz	10.00	11.00	13.00	16.00	20.00
Pike Poles not Ironed, ₩ doz.	6.00	7.00	9.00	12.00	16.00
Setting Poles, ₩ doz	14.00	15.00	17.00	....	....

Swamp Hooks....₩ doz $18.00
Landing Blocks....₩ doz $22.50
Skidding Tongs....₩ doz $51.00
Log Binders....₩ doz $26.00
Bended Boot Calks, 1 to 5 M, dis 25 %; 5 to 10 M, dis 30 %
Square Steel Boot Calks....dis 40 %
Chain Rafting Dogs....₩ 100 $12.50
Ring Rafting Dogs...₩ 100, med., $10.00; large, $12.00
Timber Grapples....₩ doz $30.00
Lustro.
Four-ounce bottles....₩ doz. $1.75; ₩ gro. $17.00 net
Mallets.
Hickory....dis 20&10 %
Lignumvitæ....dis 20&10 %
Penfield Block Co , Hickory and L. V...dis 30 @ 30&10 %
Mattocks.
Regular list....dis 60 @ 60&10 %
Meat Cutters.
Dixon's—Nos.... 1 2 3 4
₩ doz.... $14.00 17.00 19.00 30.00—dis 45&5 %
Woodruff's....Nos. 100 150
₩ doz. $15.00 18.00—dis 45&5 %
Champion....Nos. 200 300 400
₩ doz. $22.00 27.00 40.00—dis 45&5 %
Hales'....Nos. 11 12 13
₩ doz...$27.00 33 00 45.00 } dis 70&5 @ 70 & 10 %
American....dis 30 %
Nos.... 1 2 3 4B
Each....$5.00 7.00 10.00 25.00 50.00 60.00
Enterprise....dis 30 %
Nos.... 10 12 22 32 42
Each....$3 00 2.50 4.00 6.00 10.00
Pennsylvania....dis 40&10 %
Nos.... 1 2 3 00
₩ doz.... $24.00 28.00 34.00 28.00
Miles' Challenge..Nos. 1 2 3
₩ doz.. $22.00 30.00 40.00—dis 45@45&5 %
Kieser's No. 55....$40 ₩ doz, dis 40 @ 40&10 %
Kieser's Gem....$25 ₩ doz, dis 40 @ 40&10 %
Kieser's Monarch....$45 ₩ doz, dis 40 @ 40&10 %
Kieser's Butcher....$40 each, dis 20 @ 20&5 %
Straw Cut..Nos.. 5 2 6 8
Each....$50.00 75.00 80.00 225.00—dis 20 @ 25 %
Beef Shavers Enterprise Mfg. Co....dis 20&10 @ 30 %
Chadborn's Smoked Beef Cutter....₩ doz, $66.00
Mincing Knives.
Am. (2d quality), ₩ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18....Net
Lothrop's....dis 20&10 %
Smith's. ₩ doz, Single, $2.00; Double, $3....dis 40@45 %
Knapp & Cowles....dis 50&10@60 %
Molasses Gates.
Stebbins' Pat's....dis 70&10@75&5 %
Stebbins' Genuine....dis 66⅔&10 %
Stebbins' Tinned Ends....dis 40&10 %
Chase's Hard Metal....dis 50&10 %
Rush's....dis 20 %
Lincoln's Pattern....dis 66⅔&10 %
Reed's....dis 20&10 %
Cross Nos.. 1 2 3 4
$7.00 8.00 9.00 10.00..₩ doz, dis 60&10&10 %
Money Drawers.—₩ doz.. $18.
Muzzles.—Safety. ₩ doz, $3....dis 25 %
Nails....See Trade Report
Wire Nails. list April 13. '86.dis 50&10 @ 50&10&5 %
Wire Nails, Standard Penny....₩ keg, card rate, $3.75
Wire Carpet Nails....See Tacks
Nail Puller.
Curtiss Hammer....₩ doz $9.00 net
Giant, No. 1....₩ doz $30.00, dis 10 %
Pelican....₩ doz $9.00. dis 25 %
Boss....₩ doz $30, dis 30 %
Nuts and Washers.
Square Nuts, ⅜ and smaller....9¼¢ off list
Square Nuts. 7-16 and larger....8¼¢ off list
Hexagon Nuts. ⅜ and smaller....10¼¢ off list
Hexagon Nuts, 7-16 and larger....9¼¢ off list
Washers, ⅜ and smaller....9¼¢ off list
Washers 7-16 and larger....8¼¢ off list
In lots less than 100 ℔, ₩ ℔ add ¼¢ to list, 1 ℔ boxes, 1¢ to list.
Nut Crackers.
Table (Humason & Beckley Mfg. Co.)....dis 40 %
Blake's Pattern....₩ doz $2.00, dis 10 %
Turner & Seymour Mfg. Co....dis 50 %
Oakum.
Government....₩ ℔ 7¢
U. S. Navy....₩ ℔ 6½¢
Navy....₩ ℔ 5½¢
Oilers.
Zinc and Tin....dis 65&5@70 %
Brass and Copper....dis 50&10 %
Malleable, Hammers' Improved, No 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz....dis 10 @ 10&10 %
Malleable, Hammers, Old Pattern, same list...dis 40 %
Prior's Patent or "Paragon" Zinc dis 60&5 @ 60&10 %
Prior's Patent or "Paragon" Brass....dis 50 %
Olmstead's Tin and Zinc....dis 60 %
Olmstead's Brass and Copper....dis 50 %
Broughton's Zinc....dis 60 %
Broughton's Brass....dis 50 %
Packing, Steam
N. Y. Belting & Packing Co....dis 50 @ 50&10 %
American Packing....10¢ @ 11¢ ₩ ℔
Russia Packing....14¢ ₩ ℔
Italian Packing....14 @ 15¢ ₩ ℔
Cotton Packing....15 @ 18¢ ₩ ℔
Jute....8 @ 9¢ ₩ ℔
Padlocks.—See Locks.
Pails, Galvanized Water.

Quarts	10	12	14
Hill's Light Weight, ₩ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₩ doz.	3.00	3.25	3.75
Whiting's	2.75	3.00	3.25
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.
Pencils
Faber's Carpenters'....high list, dis 50 %
Faber's Round Gilt....₩ gro $5.25 net
Dixon's Lead....₩ gro $4.50 net
Dixon's Lumber....₩ gro $6.75 net
Dixon's Carpenters'....dis 40&10 %
Picks.
Railroad, 5 to 6, $11.00; 6 to 7, $12....dis 60 @ 60&10 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13....dis 60 @ 60&10 %
Picture Nails.
Brass Head, Sargent's list....dis 50&10&10 %
Brass Head, Combination list....dis 50&10 %
Porcelain Head, Sargent's list....dis 50&10&10 %
Porcelain Head, Combination list....dis 40&10 %
Niles' Patent....dis 40 %
Pinking Irons....₩ doz 65¢ ne

Pipe, Wrought Iron.
1¼ and under, Plain....dis 42½ %
1¼ and under, Galvanized....dis 32½ %
1½ and over, Plain....dis 57½ %
1½ and over, Galvanized....dis 40 %
Boiler Tubes....dis 52½ %
Planes and Plane Irons.
Wood Planes—
Molding....dis 15&2 %
Bench, First Quality....dis 20&2 %
Bench, Second Quality....dis 25&2 %
Bailey's (Stanley R. & L. Co.)....dis 20&10 %
Iron Planes—
Bailey's Stanley R. & L. Co.)....dis 30&10 %
Bailey's "Victor"....dis 20&10 %
Steer's Iron Planes....dis 35 @ 35&5 %
Meriden Mal. Iron Co.'s Iron Planes....dis 30&10 %
Davis's Iron Planes....dis 20&10 %
Plane Irons—
Plane Irons....dis 20&10 %
Plane Irons, Butcher's....$5.00 @ $5.25 to £
Plane Irons, Buck Bros....dis 30 %
Plane Irons, Middlesex Mfg. Co., "Baldwin Iron," Single and Cut....dis 20 @ 25 %
Double....dis 33⅓ @ 40 %
L. & I. J. White....dis 25 %
Pliers and Nippers.
Button's Patent....dis 30&10 @ 40 %
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₩ doz dis 20&10@33⅓ %
Humason & Beckley Mfg. Co....dis 30 %
Gas Pliers....dis 60 %
Gas Pliers, Custer's Nickel Plated....dis 6 &5 %
Eureka Pliers and Nippers....dis 40 %
Russell's Parallel....dis 25 %
P. S. & W. Cast Steel....dis 50 %
P. S. & W. Tinners' Cutting Nippers....add 6 % dis 10 %
Carew's Pat. Wire Cutters....dis 20 %
Plumbs and Levels.
Standard List....dis 70&10@70&10&10 %
Disston's....dis 45&10 %
Pocket Levels....dis 70&10@70&10&10 %
Davis Iron Levels....dis 30 %
Davis' Inclinometers....dis 10&10 %
Poppers, Corn.
Round or square, 1 qt....₩ gro $14.50 @ $15
Round or Square, 2 qt....₩ gro $25 @ $26
Post Hole and Tree Augers and Diggers.
Samson Post Hole Digger....₩ doz $36.00, dis 20&10 %
Fletcher Post Hole Augers....₩ doz $36.00 dis 20 %
Eureka Diggers....₩ doz $16 @ $17
Leed's....₩ doz $8.00 @ $9.00
Vaughan's Post Hole. Auger, per doz, $24.00....dis 33⅓ @ 33⅓&5 %
Kohler's Little Giant....₩ doz $18.00
Kohler's Hercules....₩ doz $16.00
Kohler's New Champion....₩ doz $9.00
Schneidler....₩ doz $16 @ $17
Ryan's Post Hole Diggers....₩ doz $24
Cronk's Post Bars....doz $60, dis 50&5 @ 50&10 %
Potato Parers.
White Mountain....₩ doz $5.00 @ 5.50
Antrim Combination....₩ doz $8.00
Hoosier....₩ doz $13.50
Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw ₩ doz $18.00....dis 20&10 %
Disston's Pruning Hook....₩ doz $12.00, dis 20&10 %
E. S. Lee & Co.'s Pruning Tools....dis 40 %
Pruning Shears, Henry Pat...₩ doz $3 75 @ $4.00 net
Henry's Pruning Shears....₩ doz $4.25 @ $4.50 net
Wheeler, M. & Co.'s Combination...₩ doz $12, dis 20 %
Dunlap's Saw and Chisel....₩ doz $8.50, dis 30 %
J. Mallinson & Co....No. 1, $5.25; No. 2, $7.25
Pulleys.
Hot House, Awning, &c....dis 60&10 %
Japanned Screw....dis 60&10 %
Brass Screw....dis 60&10 %
Japanned Side....dis 66⅔&10 %
Japanned Clothes Line....dis 60&10 %
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 } dis 50&10 @ 50&10&5 %
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70...dis 50 %
Hay Fork, "F" Common and Pat. Bushed....dis 20 %
Hay Fork, Tarbox Pat. Iron....dis 20 %
Hay Fork, Reed's Self-Lubricating....dis 60 %
Shade Rack....dis 45 %
Tackle Blocks....See Blocks
Pumps.
Cistern, Best Makers....dis 50 %
Pitcher Spout, Best Makers....dis 60 %
Pitcher Spout, Cheaper Goods....dis 70 @ 70&5 %
Punches.
Saddlers' or Drive, good quality....₩ doz 65¢ @ 70¢
Bemis & Call Co.'s Cast Steel Drive....dis 50&5 %
Bemis & Call Co.'s Springfield Socket....dis 50&5 %
Spring, good quality....₩ doz $2.50 @ $2.60
Spring, Leach's Patent....dis 15 %
Bemis & Call Co.'s Spring and Check....dis 40 %
Solid Tinners'....₩ doz $1.44, dis 55 %
Tinners' Hollow Punches....dis 20&2 %
Rail.
Sliding Door, Wrought Brass ₩ ℔ 35¢, dis 20@25 %
Sliding Door, Bronzed Wrt. Iron....₩ foot 7¢
Sliding Door Iron, Painted....₩ foot 4¢, dis 20&10&5 %
Barn Door, Light....Inch. ½ ⅝ ¾
Per 100 feet.... $2.50 3.00 4.40—dis 10 %
B. D. for N. E. Hangers— Small. Med. Large
Per 100 feet.... $2.15 2.70 3.25 net
Terry's Wrought Iron, 5¢ ₩ foot....net
Victor Track Rail, 7¢ ₩ foot....dis 50&2 %
Rakes.
Cast Steel....dis 60&10 @ 60&10&10 %
Malleable....dis 60&10 @ 60&10&10 %
Piqua Handle and Mfg. Co....dis 70 %
Razor.
J. R. Torrey Razor Co....dis 30 %
Wostenholme & Butcher....$10 to £, dis 10 %
Razor Strops.
Genuine Emerson....dis 60 @ 60&5 %
Imitation Emerson....₩ doz $2.00, dis 20&10&10 %
Torrey's....dis 20 %
Badger's Belt and Combination....₩ doz $2
Lamont Combination....₩ doz $4
Rivets.
Black and Tinned Iron, Flat Head M Rivets (in packages and in bulk) / Black and Carriage (in C packages) } dis 50 %
Iron Rivets (other than above) in bulk / Black and Tinned Burrs } dis 45 %
Bay State, ordinary, in bulk....dis 55 %
NOTE.—Rivets are frequently sold at concessions of 7½ @ 10 % from above prices.
Copper Rivets and Burrs....dis 60&5 @ 60&10 %
Nos. 7 8 9 10 11 12 13 14 15
₩ ℔ 49¢ 50¢ 52¢ 54¢ 56¢ 58¢ 60¢ 65¢ 70¢
Rivet Sets....dis 50&2 @ 50&10 %
Rods.
Stair, Brass....dis 25&10&5 %
Stair Black Walnut....₩ doz 40¢
Rollers.
Barn Door, Sargent's list....dis 60&10&10 %
Acme (Anti-Friction)....dis 55 %
Union Barn Door Roller....dis 70 %
Rope.—Mnf'rs list, July 27, 1886.
Manila....¾ inch and larger ₩ ℔ 13 ¢
Manila....⅝ inch ₩ ℔ 13½¢
Manila....½ and 5-16 inch ₩ ℔ 14 ¢
Manila Tarred Rope....₩ ℔ 12½¢
Manila, Hay Rope....₩ ℔ 13 ¢
Sisal....¾ inch and larger ₩ ℔ 10¼¢
Sisal....⅝ inch ₩ ℔ 11 ¢
Sisal....½ and 5-16 inch ₩ ℔ 11½¢
Sisal, Hay Rope....₩ ℔ 10½¢
Sisal, Tarred Rope....₩ ℔ 10 ¢
Sisal, Single Ply Lath Yarn....₩ ℔ 9½¢
} Dis 1@1¼¢
Cotton Rope....₩ ℔ 15 @ 18¢ net
Jute Rope....₩ ℔ 7¢
Rules.
Boxwood....dis 80&10 %
Ivory....dis 55 @ 55&10 %
Stephens' Ivory....dis 50 %
Sad Irons.
From 4 to 10, at factory....₩ 100 ℔ $2.35 @ $2.50
Self Heating....₩ doz. $9.00 net
Self-Heating, Tailors'....₩ doz. $18.00 net
Gleason's Shield and Toilet....dis 25 %
Mrs. Pott's Irons, Double Pointed....dis 40 @ 40&10 %
Mrs. Pott's Irons, Square Back....dis 40 @ 40&10 %
Enterprise Star Irons, new list, July 20, 1882....dis 40 %
Combined Fluter and Sad Iron...₩ doz. $15.00, dis 15 %
Fox Reversible, Self-Fluter....₩ doz., $24.00 net
Chinese Laundry (N. E. Butt Co.)....8¼¢, dis 15 %
New England....5¢, dis 15 %
Sand Paper and Emery Paper.
List April 19, 1886....dis 25 @ 27 %
Sash Cord.
Common....₩ ℔, 11¢ @ 11½¢
Patent....₩ ℔, 13½¢ @ 14¢
White Cotton Braided, fair quality....₩ ℔ 28¢ @ 29¢
Common Russia Sash....₩ ℔ 11¢
Patent "...." 18¢
Cable Laid Italian "...." 26¢
India Cable Laid "...." 14¢
Silver Lake, A Quality White....50¢, dis 10&10&5 %
Silver Lake, A Quality, Drab....55¢, dis 10&10&5 %
Silver Lake, B Quality, White....50¢, dis 10&10&5 %
Silver Lake, B Quality, Drab....55¢, dis 10&10&5 %
Silver Lake, C Quality, White (only)....28¢ @ 29¢
Sylvan Spring, A Quality, 50@55¢, dis 10&10@10&10&10 %
Samson, Braided, White Cotton...50¢ dis 20 @ 20&10 %
Samson, Braided, Drab Cotton...55¢ dis 20 @ 20&10 %
Samson, Braided, Italian Hemp...55¢ dis 20 @ 20&10 %
Samson, Braided, Linen....80¢ dis 20 @ 20&10 %
Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 ₩ gross....dis 33⅓ %
Ferguson's....dis 33⅓ %
Morris Sash Locks, Iron....dis 60&10 %
Morris Sash Locks, Iron, Nos. 04½, 4½, 5....dis 75
Real Bronze....dis 50 %
Walker's....dis 10 %
Attwell Mfg. Co....dis 25 @ 33⅓ %
Hammond's Window Springs....dis 40 %
Common Sense, Japanned, Coppered and Bronzed....₩ gross
Common Sense, Nickel Plated....₩ gross $12.00 net
Universal....dis 30 %
Kempshall's Gravity....dis 60 %
Kempshall's Model....dis 60@60&10 %
Corbin's Daisy, list February 15, 1886....dis 70 %
Payson's Perfect....dis 50&10&5 @ 60 %
Hugunin's New and Improved Adjustable Sash Balances, list March, 1885....dis 33⅓ %
Hugunin's New Sash Locks, list March, 1885..dis 33⅓ %
Stoddard "Practical"....dis 10 %
Ives Patent....dis 55 %
Liesche's Nos. 100 & 110, ₩ gro, $8; 105, $10..dis 20&10 %
Sash Weights.
Solid Eyes, in ton lots....₩ ton, $22.50
Sausage Stuffers or Fillers.
Miles' "Challenge"....₩ doz. $20, dis 50@50&5 %
Perry....₩ doz. No. 1, $15; No. 0, $21, dis 50@50&5 %
Draw Cut No. 4....each, $30.00, dis 20 %
Enterprise Mfg. Co....dis 20&10 @ 30 %
Silver's....dis 25 %
Saws
Disston's Circular, Mill and Cross Cut....dis 45&10 %
Disston's Hand, Panel, Rip, &c....dis 20&10 %
Atkins' Circular....dis 50 %
Atkins' Silver Steel Diamond X Cuts....₩ foot 75¢
Atkins' Concave Tooth Dexter X Cuts....₩ foot 55¢
Atkins' Special Steel Diamond X Cuts....₩ foot 32¢

Atkins' Champion and Electric Tooth X Cuts....₩ foot 30¢
Atkins' Hollow Back X Cuts....₩ foot 21 @ 22¢
Atkins' Shingle, Mulay, Drag, &c....dis 45 %
W., M. & C. Hand....dis 30 @ 30&5 %
W. M. & C. Champion X Cuts, Regular....₩ foot 26¢
W. M. & C. X Cuts, Thin Back....₩ foot 29¢
Peace Circular and Mill....dis 45&10 %
Peace Hand Panel and Rip....dis 20&10 @ 20&10&5 %
Peace Cross Cuts, Standard....₩ foot 25¢
Peace Cross Cuts Thin Back....₩ foot 28¢
Peace Band Saws, all widths....dis 20&10 %
Richardson's Circular....dis 45@45&10 %
Richardson's Mill....dis 45@45&10 %
Richardson's X-Cuts, No. 1, 30¢: No. 2, 27¢: No. 3, 25¢
Boynton's Lightning Panel, Butcher, &c....dis 25&10 %
Boynton's Lightning X Cuts....₩ ft 32¢ @ 33¢
Boynton's Lightning One Man X Cuts..₩ ft 38¢ @ 40¢
Boynton's Lightning Buck Saws...₩ doz $6.00, dis 10 %
Hack Saws—
Griffin's Hack Saws, complete....dis 40&10 @ 50%
Griffin's Hack Saw, Blades only....dis 40&10 @ 50 %
Star Hack Saws and Blades....dis 25 %
Diamond, Hack Saws and Blades....dis 25 %
Saw Frames.
White, Vermont....₩ gro $12 @ $11
Red, Polished and Varnished..₩ doz $1.50, dis 10@15 %
Saw Rods....$10 list dis 10&10 %
Saw Sets.
Stillman's Genuine....₩ doz $5.00 and $7.75, dis 40&5 %
Stillman's Imita..₩ doz $3.25 and $5.25, dis 40&5@40&10 %
Common Lever....₩ doz $2.00, dis 40&5 %
Leach's....No. 0, $8.00; No. 1, $15.00, dis 15 @ 20 %
Nash's....dis 20&10 @ 20&10&10 %
Hammer, Hotchkiss....$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent....dis 30&5 %
Bemis & Call Co.'s Lever and Spring Hammer..dis 30&5 %
Bemis & Call Co.'s Plate....dis 10 %
Bemis & Call Co.'s Cross Cut....dis 12½ %
Aiken's Genuine....$13 00, dis 50&10 %
Aiken's Imitation....$7.00, dis 55&5 %
Hart's Patent Lever....dis 20 %
Disston's, Star, $9. No. 15 Hammer, $5.50...dis 20&10 %
Atkins Adjustable....per doz $6.00
Atkins' Criterion....per doz $7.00
Atkins' Criterion for Hand Saws....per doz $7.50
Morrill's No. 1, $15.00; Nos. 3 and 4, $24....dis 40&10 %
Croissant (Keller), No. 1, $15.00; No. 2, $24.00, dis 33⅓&10 %
Boynton's No. 1, $12 ₩ doz; No. 2, $10....dis 25 %
Saw Tools.
Atkins' Patent....per doz sets $6.00
Scales.
Hatch, Counter, No. 171....₩ doz $21
Hatch, Tea, No. 161....₩ doz $7.50
Union Platform, Plain....$2.25 @ 2.30
Union Platform, Striped....$2.40 @ 2.50
Chatillon's Grocers' Trip Scales....dis 50 %
Chatillon's Eureka....dis 25 %
Chatillon's Favorite....dis 40 %
Family, Turnbull's....dis 30@30&10 %
Scale Beams.
Scale Beams, List of Jan. 12, 1882..dis 60&5 @ 60&10 %
Scale Beams, Custer....dis 30@33⅓ %
Scrapers.
Adjustable Box Scraper (S. R. & L. Co.) $6.50, dis 20&10 %
Box, 1 Handle....₩ doz $4.00, dis 10 %
Box, 2 Handle....₩ doz $6.00, dis 10 %
Defiance Box and Ship....dis 20&10 %
Foot....dis 50&10@60 %
Ship, Common....₩ doz $3.50 net
Ship, Providence Tool Co....dis 10 %
Screen Window and Door Frames.
Porter's Pat. Window and Door Frame...dis 33⅓&10 %
Screen Corner Irons, Warner's....dis 33⅓ @ 33⅓&10 %
Screw Drivers.
Douglas Mfg Co....dis 20&10&10 %
Disston's....dis 45&10 %
Disston's Patent Excelsior....dis 45&10 %
Buck Bros....dis 30 %
Stanley R. & L. Co.'s Varnished Handles....dis 60&10 %
Stanley R. & L. Co.'s Black Handles....dis 50&10 %
Sargent & Co.'s No. 1 Forged Blade....dis 70&10 %
Sargent & Co.'s No. 20....dis 66⅔&10 %
Sargent & Co.'s Nos. 40 & 30, Cast Steel....dis 55&10 %
Sargent & Co.'s No. 60, Round Blade....dis 60&10 %
Knapp & Cowles' No. 1....dis 60&20 @ 70 %
Knapp & Cowles' No. 1 Extra....dis 60 @ 60&10 %
Knapp & Cowles No. 00 & 4....dis 50&5 @ 50&10 %
Sets interchangeable....₩ doz $18.00, dis 25 %
Champion....dis 25 %
Clark's Patent....dis 20&10 @ 33⅓ %
Crawford's Adjustable....dis 30 %
Knapp & Cowles' Screw-Driver Bitts....₩ doz 90¢
Ellrich's Socket and Ratchet....dis 25 @ 25&10 %
Allard's Spiral, new list....dis 25 %
Kolb's Common Sense....₩ doz $6, dis 25&10 %
Syracuse Screw-Driver Bits....dis 30 & 30&5 %
Screws.
*Wood Screws—*List, February 15, 1886.
Flat Head Iron....dis 75&10 %
Round Head Iron....dis 70&10 %
Flat Head Brass....dis 75 %
Round Head Brass....dis 70 %
Flat Head Bronze....dis 75 %
Round Head Bronze....dis 70 %
} Extra 10 @ 10&5 % often given.
Machine—
Flat Head, Iron....dis 60 %
Round Head, Iron....dis 55 %
Bench and Hand—
Bench, Iron....dis 55&10 @ 55&10&10 %
Bench, Wood, Beech....₩ doz $2.25
Bench, Wood, Hickory....dis 20&10 %
Hand, Wood....dis 25&10 @ 25&10&5 %
Lag or Coach....dis 75 @ 75&10&5 %
Coach, Patent Gimlet Point....dis 75 @ 75&5 %
Bed....dis 25&5 %
Hand Rail, Sargent's....dis 66⅔&10 %
Hand Rail, Humason, Beckley & Co.'s..dis 70&10@75 %
Hand Rail, Am. Screw Co....dis 70 %
Jack Screws, Millers Falls....dis 50 %
Jack Screws, P. S. & W....dis 35 %
Jack Screws, Sargent....dis 60&10 @ 60&10&5 %
Scroll Saws.
Lester, complete, $10.00....dis 25 %
Rogers, complete, $4.00....dis 25 %
Scythes.—(Association prices.)
Grain Scythes—
Clipper, Full Polished, Boxed & Sharp...₩ doz $8.90
German, Cast or Silver Steel, either Half Set or Waldron, in Straw....₩ doz $8.35
Grass Scythes—
Silver Clipper, Boxed and Sharp....₩ doz $7.00
German Steel, Half Set Waldron....₩ doz $6.10
Cast Steel and German Steel, Full Set or Waldron, Sharp and Boxed....₩ doz $6.70
Bush, Bramble and Weed....₩ doz $6.70
Clover....₩ doz $7.00
Imperfect Grass and Bush....₩ doz $5.00
Imperfect Grain....₩ doz $6.70
NOTE.—The above prices are frequently shaded by jobbers who give an extra 5 or 10 %.
Scythe Snaths....dis 40&5&2 %
Shears.
American (Cast) Iron....dis 75&10 @ 75&10&5 %
Pruning....See Pruning Hooks and Shears
Barnard's Lamp Trimmers....₩ doz $3.75
Tinners'....dis 20&2 %
Seymour's, List, Dec., 1881....dis 60&10&5 %
Heinsch's, List, Dec., 1881....dis 60&10 %
Heinsch's Tailor's Shears....dis 33⅓ %
First quality C. S. Trimmers....dis 80 %
Second quality C. S. Trimmers..dis 80&10 @ 80&10&5 %
Acme Cast Shears....dis 10&10 %
Diamond Cast Shears....dis 10 %
Clipper....dis 10&10 %
Victor Cast Shears....dis 75&10 %
Howe Bros. & Hulbert, Solid Forged Steel....dis 40 %
Sheaves.
Sliding Door—
M. W. & Co., list Dec. 18, 1885....dis 45&2 %
R. & E., list Dec. 18, 1885....dis 60&2 %
Corbin's list....dis 60&10&2 %
Patent Roller....dis 60&10&2 %
Patent Roller, Hatfield's....dis 70 %
Russell's Anti-Friction, list Dec. 18, 1885..dis 60&2 %
Moore's Anti-Friction....dis 60 %
Sliding Shutter—
R. & E. list Dec. 18, 1885....dis 60&10&2 %
Sargent's list....dis 60&10 %
Reading list....dis 60&10&10 %
Ship Tools.
L. & I. J. White....dis 20&5 %
Albertson Mfg. Co....dis 25 %
Shoes, Horse, Mule, &c.
Horse—
Burden's, Perkins', Phœnix, at factory....$3.75
Walker's Forged....$3.75
*Mule—*Add $1 ₩ keg.
Shovels and Spades.
Ames' Shovels, Spades, &c., list Nov. 1, 1885....dis 20 %
NOTE.—Jobbers frequently give small extras on above.
Griffith's Black Iron....dis 50&10 %
Griffith's C.S....dis 50&10 %
Griffith's Steel....dis 60 @ 60&5 %

Griffith's Solid Cast Steel R. R. Goods....dis 20 %
Old Colony....dis 15 @ 15&10 %
St. Louis Shovel Co....dis 20 %
Hussey Binns & Co....dis 20 @ 30 %
Hubbard & Co....dis 20@20&7½ %
Lehigh Mfg. Co....dis 50&10 %
Payne Pettebone & Son, list January 2, 1882. dis 50&5@50&10 %
Remington's (Lowman's Patent)....dis 30&10 @ 40 %
Rowland's, Black Iron....dis 50&10 %
Rowland's Steel....dis 60&5 %
Shot.
Drop, ₩ bag, 25 ℔ (2¢ off for cash in 5 days)....$1.60
Drop, ₩ bag, 5 ℔....37¢
Shovels and Tongs.
Iron and Brass Head....dis 60&10&5@60&10&10 %
Skeins, Thimble.
Western list....dis 70&10@75 %
Sieves.
Buffalo Metallic, S. S. & Co., new list....dis 50&25 %
Barler's Flour Sifters....₩ doz $2.25

Sieves, Wooden Rim—	Iron.	Plated.
Mesh 18, Nested, ₩ doz.	65¢	83¢
Mesh 20, Nested, ₩ doz.	80¢	95¢
Mesh 24, Nested, ₩ doz.	95¢	$1.05

Slates.
School, by case....dis 45 @ 50 %
Soldering Irons.
Covert's Adjustable, list Jan. 1, 1886....dis 35&2 %
Spoke Shaves.
Iron....dis 45 %
Wood....dis 30 %
Bailey's (Stanley R. & L. Co.)....dis 40&10 %
Stearns'....dis 30&10 @ 30&10&10 %
Spoke Trimmers.
Bonney's....₩ doz $10.00, dis 50 %
Stearns'....₩ doz $9.00, dis 20&10 %
Ives'....No. 1, $15.00; No. 2, $12.00 ₩ doz, dis 55&10 %
Douglass'....₩ doz $9.00, dis 20 %
Spoons and Forks.
Tinned Iron—
Basting, Central Stamping Co.'s list .. dis 33⅓&2 %
Solid Table and Tea, Central Stamping Company's list....dis 33⅓&2 %
Buffalo, S. S. & Co....dis 50&10 %
Silver-Plated—
Meriden Brit. Co., Rogers....dis 50&5 @ 50&10&5 %
Reed & Barton....dis 50&5 @ 50&10&5 %
C. Rogers & Bros....50&5 @ 50&10&5 %
Rogers & Bro....50&5 @ 50&10&5 %
Wm. Rogers Mfg. Co....dis 50&10 @ 60 %
Simpson, Hall, Miller & Co....dis 50&10&5 @ 60 %
Holmes, Booth & Haydens....dis 50&10&5 @ 60 %
Holmes & Edwards Silver Co....dis 60 @ 60&10 %
H. & E. Silver Co. Steel Silver-Plated Teas, $15; Tables, $30....dis 50 @ 50&10 %
German Silver....dis 50 @ 50&5 %
German Silver, Hall & Elton....dis 40&5 %
Britannia....dis 60&10 @ 60&10&10 %
Springs.
Elliptic, Concord, Platform and Half Scroll....dis 60&5 @ 60&10 %
Squares.
Steel and Iron / Nickel-Plated } ...dis 70&5@70&10&5 %
Try Square and T Bevels....dis 60&10 %
Disston's Try Square and T Bevels....dis 45&10 %
Winterbottom's Try and Miter....dis 20&10 %
Staples.
Fence Staples, Galvanized....₩ ℔, 4¼ @ 4½¢
Fence Staples, Plain....₩ ℔, 3¼ @ 3½¢
Steelyards....dis 40&10@50&5 %
Stocks and Dies.
Blacksmith's....dis 30&5 @ 40 %
"Lightning" Screw Plate....dis 10&10 @ 25 %
Stone.
Hindostan No. 1, 3½¢: Axe, 4½¢: Slips, 5½¢....
Sand Stone....₩ ℔, 2½¢
Washita Stone, Extra....₩ ℔, 25¢
Washita Stone, No. 1....₩ ℔, 20¢
Washita Stone, No. 2....₩ ℔, 16¢
Washita Slips, No. 1, Extra....₩ ℔, 50¢
Washita Slips, No. 1....₩ ℔, 40¢
Arkansas Stone, No. 1, 4 to 6 in....₩ ℔, $1.45@1.50
Arkansas Stone, No. 1, 6 to 9 in....₩ ℔, $1.75
Turkey Oil Stone, Chase....4 to 8 in., ₩ ℔, 60¢
Turkey Slips, Chase....₩ ℔, $2.00
Lake Superior....₩ ℔, 17¢
Lake Superior Slips....₩ ℔, 31@32¢
Stove Polish.
Joseph Dixon's....₩ gro $6.00, dis 10 %
Gem....₩ gro $4.50, dis 10 %
Gold Medal....₩ gro $6.00, dis 25 %
"Mirror"....₩ gro $6.00, dis — %
Lustro....₩ gro $4.75 net
Ruby....₩ gro $3.75 net
Rising Sun....₩ gro $5.75 net
Dixon's Plumbago....₩ ℔ 8¢ net
Boynton's Noon Day, ₩ gro....$5.00
Parlor Pride Stove Enamel....₩ gross, $13
Yates' Liquid, 2 3 5 10 gal. cans
₩ gal... $1.00 .90 .75 .65
Jet Black....₩ gro $3.50
Japanese....₩ gro $3.50
Fireside....₩ gro $2.50
Tacks, Brads, &c.
List, Sept 1, 1882, and supplement, Jan. 1, 1883
American Iron Carpet Tacks....dis 75&10 %
Steel Carpet Tacks....dis 75&10 %
Swedes Iron Carpet Tacks....dis 75&10 %
Swedes Iron Wire Carpet Tacks....dis 75&5 %
Swedes Iron Tacks....dis 75 %
Swedes Iron Upholsterers' Tacks....dis 70&10 %
Tinned Swedes Iron Tacks....dis 70&10 %
Tin'd Swedes Iron Upholsterers' Tacks....dis 70&10 %
Gimp and Lace Tacks....dis 70&5 %
Tinned Gimp and Lace Tacks....dis 70&5 %
American Iron Cut Tacks....dis 75&10 %
Copper Tacks....dis 60&5 %
Copper Finishing and Trunk Nails....dis 60&5 %
Cigar Box Nails....dis 55&10 %
Finishing Nails....dis 55&10 %
Hungarian Nails and Miners' Tacks....dis 60&5 %
Trunk and Clout Nails....dis 60&5 %
Tinned Trunk and Clout Nails....dis 60&5 %
Basket Nails....dis 60&5 %
Chair Nails....dis 60&5 %
Common and Patent Brads....dis 60&5 %
Tinned Capped Trunk Nails....dis 45 %
Looking-Glass Tacks....dis 45 %
Picture-Frame Points....dis 45 %
Leathered Carpet Tacks....dis 45 %
Brush Tacks....dis 45 %
Shoe Finders'....List June 1, 1886, dis 10&10 %
Lining and Saddle Nails, List Jan. 1, 1886:
Silvered....dis 30&10 %
Japanned....dis 20&10 %
Walkey Hardware Co.'s Steel Carpet Tacks:
Diamond Brand....₩ doz 12¢; tinned, 16¢
Circle Brand....₩ doz 24¢; tinned, 32¢
Double-pointed Tacks....dis 80 @ 80&10 %
Wire Carpet Nails....dis 50 @ 50&10 %
Steel Wire Brads, R. & E. Mfg. Co....dis 50 @ 50&10 %
Tap Borers.
Common and Ring....dis 20&10 %
Ives' Tap Borers....Nos. 1, 2, 4—dis 15&10 %
Ives' Tap Borers....Nos. 13, 14—dis 25&10 %
Enterprise Mfg. Co....dis 20&10 %
Clark's....dis 33⅓ @ 35 %
Tapes, Measuring.
American....dis 25&10 %
Spring....dis 40 %
Chesterman's....Regular list dis 25 @ 30 %
Thermometers.
Tin Case....dis 80 @ 80&10 %
Thimble Skeins.—See Skeins.
Ties, Bale.
Steel Wire, Standard list....dis 50&10 %
Tinners' Shears, &c.
Shears and Snips (P. S. & W.)....dis 20 @ 25 %
Punches—See Punches.
Snips, J. Mallinson & Co....dis 33⅓ %
Tinware
Stamped, Japanned and Pieced, Central Stamping Co., list June 1, 1886. dis 25&2 @ — %
Pieced, S. S. & Co....dis 30&2 %
Japanned, S. S. & Co....dis 25&10&2 %
Stamped, S. S. & Co....dis 33⅓&2 %
} Extras some times given.
Tobacco Cutters.
Enterprise Mfg. Co. (Champion)....dis 20&10 @ 30 %
Wood Bottom....₩ doz $5.00 @ $5.25
All Iron....₩ doz $4.25
Nashua Lock Co.'s....₩ doz $18.00, dis 50 @ 55 %
Wilson's....dis 55 %
Clipper (Sargent & Co.)....₩ doz $24, dis 50&10&10 %
Acme....₩ doz $20.00, dis 40 %
Transom Lifters
Wollensak's Patent Iron Bronzed....dis 50 %
Reiher's Improved Self-Locking (Class 301)....dis 40 %
Reiher's Improved Set Screw (Class 201)....dis 45 %
Reiher's (Class 101)....dis 50&10 %
Excelsior....dis 50&10&2 %
Shaw's....dis 45&10
Payson's Universal....dis 40 %

Traps.
Game—
Newhouse....dis 35 %
Oneida Pattern....dis 60&10&10 @ 70 %
Game, Blake's Patent....dis 40&10&5 %
Mouse and Rat—
Mouse, Wood, Choker....₩ doz holes, 15¢
Mouse, Round Wire....₩ doz $1.50, dis 10 %
Mouse, Cage, Wire....₩ doz $2.50, dis 10 %
Mouse, Catch-'em-alive....₩ doz 2.50, dis 15 %
Mouse, "Bonanza"....₩ gross $10 net
Mouse, Delusion....₩ gross $18.00, dis 15 %
Rat, "Decoy"....₩ gross $10.00, dis 10 %
Ideal....₩ gross $10
Cyclone....₩ gross $5.25
Trowels
Lothrop's Brick and Plastering....dis 20&10@30
Reed's Brick and Plastering....dis 40
Disston's Brick and Plastering....dis 20&10@20&10&5
Peace's Plastering....dis 25
Clement & Maynard's....dis 20
Rose's Brick....dis 15 @ 20
Brade's Brick....dis 25
Worrall's Brick and Plastering....dis 20
Garden....dis 50
Triers.
Butter and Cheese....dis [illegible]
Trucks, Warehouse, &c.
Penfield Block Co.'s list, 1882....dis 40
Tubes, Boiler.—See Pipe.

Twine.	BC.	lb.
No. 9, Flax Twine, ¼ and ½ ℔ Balls	24¢	31¢
No. 12, " " ¼ and ½ "	22¢	21¢
No. 18, " " ¼ and ½ "	20¢	22¢
No. 24, " " ¼ and ½ "	20¢	22¢
No. 36, " " ¼ and ½ "	19¢	21¢
No. 264, Mattrass, ¼ and ½ "		50¢

Chalk Line, Cotton, ½ ℔ Balls....28¢
Mason Line, Linen, ½ "....60¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine)....14¢
3-Ply Hemp, 1 ℔ Balls....15¢
3-Ply Hemp, 1½ ℔ Balls....[illegible]
Cotton Wrapping, 5 Balls to ℔....14¢ @ 20¢
2, 3, 4 and 5 Ply Jute, ½ ℔ Balls....11¢
Wool....6¢ @ 6½¢
Paper....13¢ @ 14¢
Cotton Mops—6, 9, 12 and 15 ℔ to doz....17¢
Vises.
Solid Box....dis 50&10 @ 60 %
Parallel—
Fisher & Norris Double Screw....dis 15&10
Stephens'....dis 25
Parker's....dis 20 @ 25 %
Wilson's....dis 55
Howard's....dis 40
Bonney's....dis 40
Millers Falls....dis 40 @ 40&10
Trenton....dis 40&5 @ 40&10
Merrill's....dis 15@20
Sargent's....dis 60&10&10
Backus and Union....dis 40
Double Screw Leg....dis 15&10
Prentiss....dis 25 @ 25&5
Simpson's Adjustable....dis 40
Saw Filers—
Bonney's, Nos. 2 & 3....₩ doz $15.00, dis 40
Stearn's....dis 40
Sargent's....dis 60&10&10
Hopkins'....₩ doz $17.50, dis 10
Reading....dis 37½&10
Wentworth....dis 20&10
Cowell Hand Vises....dis 20
Bauer's Pipe Vises....dis 10 %
Wagon Boxes.
Per lb....2½¢
Washer Cutters.
Smith's Patent....₩ doz $12.00, dis 20&10&10
Johnson's....₩ doz $11.00, dis 33⅓
Penny's....₩ doz Pol. $14; Jap'd, $16..dis 55
Appleton's....₩ doz $16.00, dis 60&10
Bonney's....dis 30&10
Washers.—See Nuts and Washers.
Wedges.—Iron....₩ ℔ 3¼¢
Steel....₩ ℔ 3¾¢
Well Buckets, Galvanized.
Hill's....₩ doz. 12 qt., $3.50; 14 qt., $4.00
Iron Clad....₩ doz., 14 qt., $8—dis
Whiting's Flat Iron Band....₩ doz $4.25
Whiting's Wired Top....₩ doz $4 00
Well Wheels—8 in., $1.75; 10 in., $2.05; 12 in., $2.75
Wire.
Iron—
Market, Br't & Ann'ld, Nos. 0 to 18 dis 72½@72½&5 %
Market, Coppered, Nos. 0 to 18....dis 65&5 @ 7[illegible]
Market Galvanized, Nos. 0 to 18....dis 60&10 @ 65
Market Tinned, Tinned list, Nos. 0 to 18..dis 60&10
Stone Bright and Annealed, Nos. 16 to 18, dis 65&5 %
Stone, Bright and Annealed, Nos. 19 to 26..dis 65&10
Stone, Bright and Ann'd, Nos. 27 to 36....dis 72½&5
Stone, Galvanized, Nos. 19 to 30....dis 55&5
Stone, Tinned, Tinned list, Nos. 18 to 36....dis 60&5
Tinned Broom Wire, Nos. 18 to 24....dis 60&5
Annealed Fence, Nos. 8 & 9....dis 65&5
Annealed Grape, Nos. 10 to 14....dis 65&5
Brass and Copper, new list, Jan. 18, '84..dis 33⅓@30&10
Barb Fence....See Trade Report
Wire on Spools....dis 65
Malin's Spld. Wire, 1 ℔, ½ ℔ & ¼ ℔ sp'ls....40&10&5
Cast Steel Wire....dis 50
Stubs' Steel Wire....$6.00 to £, dis 40
Steel Music Wire, Nos. 12 to 30....55¢ ₩ ℔
Picture Wire....dis 60&10
Barb Wire Safety Guards....₩ 1000 $9.00, dis 25
Wire Clothes Lines. See Lines.
Wire Cloth.
Green, drab and black, best quality, ₩ 100 sq. ft....$[illegible]
Wire Goods.—See Bright Wire Goods.
Wire Rope.—List May 1, 1886....dis 33⅓ %
Wrenches.—American Adjustable....dis 45
Baxter's Adjustable "S"....dis 35&10
Baxter's Diagonal....dis 35&10 %
Coes' Genuine....cash in 10 days, dis 60&3
Coes' "Mechanics'"....dis 60&10&3
Coes Pattern, Malleable....dis 80&10 @ 80&10&5
Coes' Pattern, Wrought....dis 80&10
Girard Standard....dis 70&10
Girard Agricultural....dis 80&10 @ 80&10&5 %
Lamson & Sessions' Engineers'....dis 60&10 %
Lamson & Sessions' Standard....dis 70&10 %
Lamson & Sessions' Agricultural....dis 80 %
Sterling Wrench, Wrought....dis 80&10
Bemis & Call's Patent Combination....dis 30&5
Bemis & Call's Merrick's Pattern....dis 35
Bemis & Call's Brigg's Pattern....dis 35
Bemis & Call's Cylinder or Gas Pipe....dis 40&
Bemis & Call's No. 3 Pipe....dis 35&5
Aiken's Pocket (Bright)....$8.00, dis 50&10
The Favorite Pocket (Bright)....₩ doz $4.00, dis 40
Webster's Patent Combination....dis 25
Boardman's....dis 25@25&10
Always Ready....dis 25&5
Alligator....dis 40&10
Donohue's Engineer....dis 25
Acme, Bright....dis 60&3 @ 60&10
Acme, Nickeled....dis 45
Acme, Bicycle, 4½ in....dis 45
Walker's....dis 60&5
Diamond....dis 40
Diamond Patent Steel....dis 40 %

Wringers.	Per doz.
Adams & Co. No. 8	$27.00
Advance	27.00
Excelsior, for Stationary Tubs, No. E, 10-inch	36.00
Excelsior, for Stationary Tubs, No. F, 11-inch	40.50
Excelsior, with Folding Bench, No. A. 10-inch	45.00
Excelsior, with Folding Bench, No. B, 11-inch	49.50
"Metropolitan," No. 2	[illegible]
"Metropolitan," No. 2½	27.00
Novelty, for Common Tubs, No. 2 & 2½, 10-in	27.00
Novelty, for Common Tubs, No. 3 & 3½, 11-in	31.50
No. 99 Improved 2½	[illegible]
Peerless, No. 2½	27.00
Peerless, No. 3½	31.50
Universal, No. 2½	27.00
Universal, No. 2	[illegible]
Universal, No. 1½	31.50
Universal, No. 1¼	36.00
Universal, No. 1	54.00
Universal, for Set Tubs, A 2½	36.00
Universal, for Set Tubs, E 1½	45.00
Universal, for Set Tubs, C 1	63.00

} net, dis 2 % cash in 10 days.

Empire Purchase Gear Wringers—
No. 3, Round or Set Tub, 10-inch roll....$45
No. 4, Round or Set Tub, 11-inch roll....54
No. 5, Round or Set Tub, 12-inch roll....63
No. 3, Bench, 10-inch roll....58
No. 4, Bench, 11-inch roll....6[illegible]
No. 5, Bench, 12-inch roll....75
Empire, Daisy, 10-inch roll....20
} dis 2 %, Cash in 10 days.
Eureka....₩ doz $21
Am. M. Co. Wringer No. 2....$2
Superior....$[illegible]
Wrought Goods.
Staples Hooks, &c....dis 80&10 @ 80&20

WHOLESALE METAL PRICES, August 25, 1886.

METALS.

IRON.—DUTY: Bars, 8-10¢ to 1 1-10¢ ₩ lb; provided that no Bar iron shall pay a less rate of duty than 35 %. Sheet, 1 1-0¢ to 1 5-10¢ ₩ lb. Band, Hoop and Scroll, 1¢ to 1 4-10¢ ₩ lb. Railroad Bars weighing more than 25 lb ₩ yard, 7-10¢ of 1¢ ₩ lb.

Standard American Pig Iron.

Foundry No. 1 X	₩ ton	$18.00 @ 18.50
Foundry No. 2 X	₩ ton	17.00 @ 17.50
Gray Forge	₩ ton	15.75 @ 16.25

No. 1 Scotch Pig Iron.

Carnbroe	₩ ton	$18.50 @ 19.00
Coltness	₩ ton	19.75 @ 20.00
Shotts	₩ ton	19.75 @ 20.00
Glengarnock	₩ ton	18.50 @ 19.00
Gartsherrie	₩ ton	19.00 @ 19 25
Langloan	₩ ton	19.50 @ 20.00
Summerlee	₩ ton	19.25 @ 19.75
Dalmellington	₩ ton	18.50 @ 19.00
Eglinton	₩ ton	17.50 @ 18.00
Clyde	₩ ton	18.00 @ 18.50

Rails.

Steel, at Eastern mills	₩ ton	$34.50 @ 35.00
Old Rails, Ts	₩ ton	$19.50 @ 20.00

Scrap.

Wrought, ₩ ton, from yard..... $18.25 @ 18 50

Bar Iron from Store.

Common Iron: ¾ to 1 in. round and square... / 1 to 6 in. x ⅜ to 1 in	₩ lb 1.75 @ 1.80¢
Refined Iron: ¾ to 2 in. round and square... / 1 to 6 in. x ⅝ to 1 in	₩ lb 1.9 @ 2.3¢
1 to 6 in. x ¼ and 5-16	₩ lb 2.10 @ 2.30¢
Rods—⅜ and 11-16 round and sq	₩ lb 2 @ 2.3¢
Bands—1 to 6x3-16 to No. 12	₩ lb 2 @ 2.5¢
"Burden's Best" Iron, base price	₩ lb 2.9¢
Burden's "H. B. & S." iron, base price	₩ lb 2.5¢
Norway Nail Rods	5 @ 6¢

Sheet Iron from Store.

	Common American.	R. G. Cleaned.
Nos. 10 to 15	₩ lb 2.70 @ 3 ¢	3½¢
17 to 20	₩ lb 3 @	3½¢
21 to 24	₩ lb 3 @	3½¢
25 and 26	₩ lb 3.12½ @	3¾¢
27	₩ lb 3.25 @	3¾¢
28	₩ lb 3.37½ @ 3.50	¢ 4 ¢

	B. B.	2d qual.
Galvanized to 20	₩ lb 5 ¢	4½¢
Galvanized 21 to 24	₩ lb 5½¢	5 ¢
Galvanized, 25 to 26	₩ lb 5¾¢	5¾¢
Galvanized, 27	₩ lb 6¼¢	5¾¢
Galvanized, 28	₩ lb 6¾¢	6¾¢
American Russia	₩ lb A, 10¢	B, ¢
Russia	₩ lb 9¾¢ @ 10½¢	¢
American Cold Rolled B. B	₩ lb 5 ¢ @ 7 ¢	

Iron Wire.—*(See Wire.)*

STEEL.—DUTY: Ingots, Bars, Sheets, &c., valued at 4¢ ₩ lb or less, 45 % ad. val.; valued above 4¢ and not above 7¢ ₩ lb, 2¢ ₩ lb; valued above 7¢ and not above 10¢ ₩ lb, 2¾¢ ₩ lb; valued above 10¢ ₩ lb, 3½¢ ₩ lb. *Extras.*—Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 1¼¢ ₩ lb in addition to above; Steel Circular Saw Plates, 1¢ ₩ lb in addition to the above.

American Cast Steel.

For American Steel, see Pittsburgh quotations.

Chrome Steel.

Tool Steel, ordinary sizes, ⅝ to 3 inches, net	10 @ 14¢
Adamantine Shoes and Dies	8 @ ..¢
Magnet Steel	14 @ ..¢

English Steel.

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Circular Saw Plates	₩ lb 14 ¢
Round Machinery, Cast	₩ lb 10 ¢
Swaged, Cast	₩ lb 16 ¢
Best Double Shear	₩ lb 15 ¢
Blister, 1st quality	₩ lb 14 ¢
German Steel, Best	₩ lb 10 ¢
2d quality	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality	₩ lb 15 ¢
2d quality	₩ lb 14 ¢
3d quality	₩ lb 12½¢

TIN.—DUTY Plates, Sheets, Tagger and Terne, 1¢ ₩ lb; Bars, Block and Pigs free.

Banca	₩ lb 23 ¢ @ 24 ¢
Straits	₩ lb 22½¢ @ 23 ¢
English	₩ lb 23 ¢ @ 24 ¢
Bar	₩ lb 24 ¢ @ 25 ¢

Charcoal Tin Plates.

I C 10x14 225 sheets	₩ box	$5.00 @ 7.50
I C 12x12 225 sheets	"	5.25 @ 7.50
I C 20x28, 112 "	"	10.25 @ 15.25
I X 10x14 225 sheets	"	6.25 @ 9.25
I X 12x12 225 sheets	"	6.25 @ 9.50
I X 14x20, 112 "	"	6.25 @ 9.25
D C 12½x17, 100 "	"	5.00 @ 5.50
D X 12½x17, 100 "	"	6.25 @ 7.00
For each additional X add	"	1.25 @ 2 00

Coke Tin Plates.

	Best.	Ordinary.
I C 10x14	$4.75	$4.55 @ 4.60
I C 14x20		
I C 12x12	4.87½	4.75 @ ....
I C 10x20, gutters, 225 sheets	8.00	7.25
C 20x28 112 sheets	9.80 @ 10.00	

Terne Plates.

	Prime Char.	2d. quality	Coke.
I C 14x20 M.F.	$6.75		
I C 14x20 Old Process			$6.75
I C 20x28 "			13.75
I C 14x20	$4.50 @ 4 75	4.37½	
I X 14x20	6.00 @ 6.50		4.25
I C 20x28	9.00 @ 9.75	8.75	8.50 @ 8.70
I X 20x28	12.00 @ 14.00		
I C 20x300	13.50 @		

Tin Boiler Plates.

IXX 14x26, 2 sheets for No. 7, 112 sheets	@ $12.00
IXX 14x28, 2 " " No. 8, "	@ 13.00
IXX 14x31, 2 " " No. 9, "	@ 15.00

COPPER.—DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot, Lake	₩ lb	10¾¢ @ 10¾¢
Ingot, Baltimore	"	10 ¢ @ 10¼¢
Ingot Anchor	"	10 ¢ @ 10¼¢

Cold Rolled Sheet, All Sizes.

16 oz. per square foot, and heavier	₩ lb, 18¢
14 and 15 oz. per square foot	₩ lb, 19¢
12 and 13 oz. per square foot	₩ lb, 20¢
10 and 11 oz. per square foot	₩ lb, 21¢

TINNING.

Sheets, one side, 10, 12 and 14 x 48	each, 6¢
Sheets, one side, other sizes	₩ square foot 2½¢
For tinning both sides, double the above prices.	
For tinning boiler sizes, 9 in., 14 x 60	each, 15¢
For tinning boiler sizes, 8 in., 14 x 56	each, 12¢
For tinning boiler sizes, 7 in., 14 x 52	each, 12¢

Sheathing Copper. (14 x 48.)

	Hot Rolled.	Cold. Rolled.
16 oz. to sq. ft. and heavier, per lb.	$0.17	$0 18
14 oz. and up to 16 oz., per lb	.18	.19
12 oz. and up to 14 oz., per lb	.19	.20

Tinning, 6 cents each.

Copper Bottoms.

Pits and Flats, 14 oz	₩ lb 20¢
Pits and Flats, 12 oz	₩ lb 21¢

O'Neill's Patent Planished Copper.—Net.

14x48

14 and 16 oz. and heavier .27¢ By the case ₩ lb 26¢
12 oz. and lighter .30¢ " " " 29¢

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in., 14x60.
14 and 16 oz. and heavier .29¢ By the case ₩ lb 28¢
And all sizes not over 20 in. wide.)

24x48 and 30x60.

14 and 16 oz. and heavier ₩ lb 31¢
12 oz " " 34¢

Planished Brass same price as Planished Copper

Copper Wire.—*(See Wire.)*

Sheathing Metal.

Yellow Sheathing Metal, ₩ lb .....18¢ @ ...

BRASS AND GERMAN SILVER.

Brown & Sharpe's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

Brass Manufacturers' Price List, January 17, 1884..... dis. 20 @ 30 %

LEAD.—DUTY: Pig, $2 ₩ 100 lb; Old Lead, 2¢ ₩ lb: Pipe and Sheet, 3¢ ₩ lb.

Pig	4.95 @ 5.25¢
Bar	5½ @ 5¾¢
Pipe	6¾¢, dis 20 %
Block Tin Pipe	40¢, dis 20 %
Tin Lined Pipe	15¢, dis 20 %
Sheet	7¾¢, dis 20 %
Shot, ₩ bag, 25 lb	Drop, $1.60; Buck, $1.85
Chilled Shot, ₩ bag, 25 lb	$1.85

ANTIMONY.

Hallett's	₩ lb 8½ @ 9 ¢
Cookson	" 9½ @ 11 ¢

SPELTER—Duty: Pigs, Bars and Plates, $1.50 ₩ 100 lbs.

American, cash	4⅝ ¢ @ 5¢
Bergenport	9¢

ZINC—Duty: Pig or Block, $1.50 ₩ 100 lbs. Sheet, 2½¢ ₩ lb.

600 lb casks	5.60 @ 5.85¢
Zinc.—Open	6¼ @ 6¾¢
Zinc Tubing	dis. 10 @ 20 %

Zinc Tubing—Dis. 25 %.

Plain	.27
Fancy	.33
Scotch and Extra Patterns	.36

BABBITT METAL.

N. P. U	₩ lb 6½ @ 7¢
X	.10¢
X X	.15¢
J. B	.30¢

WIRE.

Market Wire.—Put up in 68 lb bundles.

Nos. 00 to 9,	10,	11,	12,	13, 14,	15, 16,	17,	18.
	10	11	11½	12½	14	15	16

Bright Market Wire	dis 67½ %
" Charcoal	dis 47½ %
" Bale Wire. Nos. 7 to 12	dis 62½ %
Annealed Market Wire	dis 67½ %
" Fence Wire, Nos. 8 and 9. / " Grape Wire. Nos. 10 to 14	
Coppered Market Wire	dis. 62½ %
" Bale Wire, Nos. 7 to 12	dis. 57½ %
Galvanized Market Wire	dis 57 ½%
" Fence Wire	

Stone or Weaving Wire.

Nos	16	17	18	19	20	21	22	23	24	25	26
Cents	14	15	16	19	20	21	22	23	24	25	26
Nos	27	28	29	30	31	32	33	34	35	36	..
Cents	28	29	30	32	33	35	37	40	45	55	..

Nos. 16 to 18	dis. 70 @ 70 %
" 19 to 26	" 70 %
" 27 to 36	" 75 @ 75 %
Galvanized Stone Wire	" 50 %

Steel Wire.

Cast Steel, Steel Wire list ..... dis. 50 %

Brass and Copper Wire.

Old English Gauge the Standard.—Dis 20 @ 25.

All Nos. to No. 16, inclusive	Common High Brass	Low Brass	Gilding Bronze and Copper.
	$0.22	$0.26	$0.30
No. 17 and 18	.23	.27	.31
" 19 and 20	.24	.28	.32
" 21	.25	.29	.33
" 22	.26	.30	.34
" 23	.28	.32	.36
" 24	.30	.34	.38
" 25	.32	.36	.40
" 26	.35	.39	.43
" 27	.38	.42	.46
" 28	.42	.46	.51
" 29	.45	.49	.54
" 30	.48	.52	.62
" 31	.51	.55	.67
" 32	.55	.59	.73
" 33	.59	.63	.82
" 34	.64	.68	.95
" 35	.70	.74	1.30
" 36	.76	.80	1.50
" 37	1.00	1.04	1.79
" 38	1.30	1.34	2.00
" 39	2.00	2.00	3.25
" 40	2.60	2.60	5.75

Spring Wire, 2 cents per pound advance. Whitened Wire, 3 cents per pound advance. Flat, Square and Half-Round Wire, 4 cents advance on Round Wire. Fancy Wire, not less than 10 cents advance on Round Wire. Spooling on one-pound Spools, 12 cents per pound extra. Spooling on ten-pound Spools or more, 2 cents per pound extra.

MISCELLANEOUS TINNERS' STOCK.

Solder.

½ & ⅓ Warranted	14¾ @ 15¼¢
Extra	14 @ 14½¢
No. 1 Refined	12 @ 13 ¢
No. 2 Solder	12 @ 12½¢
Extra wiping	11¾ @ 12¼¢

Rivets.

Iron and Tinned, new list, Dec. 10, 1881	dis. 50 %
In bulk, new list, Dec. 10, 1881	dis. 45 %
Copper Rivets and Burrs	dis. 50&10@60 %

Nos.	7	8	9	10	11	12	13	14	1
₩ lb.	49¢	50¢	52¢	54¢	56¢	58¢	60¢	65¢	70¢

Stove Bolts.

American Screw Co.'s	dis. 70 %
R. B. & W	dis. 70 %
R. & E. Mfg. Co	dis. 70 %

FRENCH GLASS.

August 20, 1885. Per Box, 50 feet.

Single Thick.

Sizes.	1st. E F H D	2d. I E H D	3d. H H D	4th. H B D
25 6 x 8 to 10 x 15	$11.50	$10.50	$10.00	$9.50
40 11 x 14 to 16 x 24	13.00	12.25	11.50	10.75
50 18 x 22 to 20 x 30	17.00	16.00	14.50	13.25
54 15 x 36 to 24 x 30	19.00	17.00	15.00	
60 26 x 28 to 24 x 36	20.00	18.50	16.25	
70 26 x 36 to 26 x 44	21.50	20.00	16.50	
80 26 x 46 to 30 x 50	23.50	22.00	19.00	
84 30 x 52 to 30 x 54	25.00	23.00	20.00	
90 30 x 56 to 34 x 56	26.00	24.00	22.00	
94 34 x 58 to 34 x 60	27.50	26.00	23.50	
100 36 x 60 to 40 x 60	31.00	28.00	26.00	

Double Thick.

Sizes.	1st. E F H D	2d. I E H D	3d. H H D	4th. H B D
25 6 x 8 to 10 x 15	$14.00	$13.50	$13.00	$12.25
40 11 x 14 to 16 x 24	17.00	16.00	15.25	14.50
50 18 x 22 to 20 x 30	22.00	20.50	19.00	
54 15 x 36 to 24 x 30	24.00	22.00	20.00	
60 26 x 28 to 24 x 36	26.00	24.00	21.75	
70 26 x 36 to 26 x 44	27.50	26.00	22.50	
80 26 x 46 to 30 x 50	30.00	28.00	24.50	
84 30 x 52 to 30 x 54	31.50	29.00	26.00	
90 30 x 56 to 34 x 56	33.00	30.50	28.00	
94 34 x 58 to 34 x 60	35.00	34.00	31.00	
100 36 x 60 to 40 x 60	38.00	36.00	34.00	

Sizes above—$15 per box extra for every 5 inches. Discount 80 %.

PAPER STOCK, &c.

(Dealers' Selling Prices.)

	Cents ₩ lb.
White Shirt Cuttings, No. 1	6¼ @ 6½
" " No. 2	5¼ @ 5¾
Mill Assorted Whites	5 @ 5½
Unbleached Muslins	5¾ @ 6
City Whites, No. 1	3½ @ 4
City Whites, No. 2	1½ @ 2
New Canton Flannels	4½ @ 4¾
New Seconds, light	3½ @ 4
" dark	2½ @ 3
Cotton Canvas	4¼ @ 4¾
Linen Canvas No. 1	4 @ 4¼
Seconds, City No. 1	1¼ @ 1¾
Seconds, City No. 2	1 @ 1¼
Colors, ₩ cwt	40 @ 50
Manila Rope	2½ @ 2¾
" Tarred	2¼ @ 2¾
Gunny Bagging, No. 1	1¾ @ 1¾
" No. 2	1½ @ 1⅝
Kentucky Bagging	2 @ 1¾
Burlap Bagging, No. 1	1¾ @ 1¾
Tar Shakings	1¾ @ 2
Hemp Twine Stock	2¾ @ 3¾
Hard White Shavings, No. 1	3½ @ 4
Soft White Shavings, No. 1	2¼ @ 2¾
White Shavings, No. 2, Soft	2¼ @ 2½
Mixed Shavings, part White	1¾ @ 2
Ledger and Writing	2¾ @ 2½
Solid Stock	1¾ @ 2
Book Stock, No 1, light	1 @ 1½
Old Newspapers	1¼ @ 1¾
Pure Manilas	1¾ @ 1⅝
Bogus Manilas and Hardwares, cwt	60 @ 100
Commons, ₩ 100 lb	55 @ 70
Binders' Board Cuttings	¼ @ ¾
Straw Board Cuttings, ₩ cwt	65 @ 75

PAINTS, OILS, &c.

Paints.

Black, Lamp—Coach Painters'	₩ lb 22 @ 24¢
" Ordinary	6¢
Black Ivory Drop, fair	18 @ 19¢
" " best	20¢
Black Paint, in oil	kegs, 8¢; assorted cans, 11¢
Blue, Prussian, fair to best	40 @ 55¢
" " in oil	45 @ 55¢
" Chinese dry	70¢
" Ultramarine	18 @ 30¢
Brown, Spanish	1¾¢
" Van Dyke	10 @ 12¢
Dryers, Patent American	asst'd cans, 9¢; kegs, 7¢
Green Chrome	15 @ 25¢
" " in oil	14 @ 18 @ 25¢
" Paris	good, 20¢; best, 25¢
" " in oil	good, 30¢; best, 35¢
Iron Paint, Bright Red	₩ lb 2½¢
" Brown	" 1¾¢
" Purple	" 3¢
Ground in oil, Bright Red	5½¢
" " Red	5½¢
" " Brown	" 5½¢
" " Purple	" 5¢
Litharge	6¼¢
Mineral Paints	2 @ 4¢
Orange Mineral	10¢
Red Lead American	6½¢
Venetian (Eng.) dry	$1.65 @ $1.70
" in oil	asst'd cans, 11¢; kegs, 8¢
" Indian Dry	9 @ 12¢
Rose Pink	10 @ 13¢
Sienna, American Raw, powdered	4¢
" Burnt, powdered	4½¢
" " in oil	10 @ 16 @ 20¢
" Raw	11 @ 15 @ 25¢
Umber, Burnt, powdered	4 @ 8¢
" " in oil	9 @ 12 @ 15¢
" Raw, powdered	4 @ 7½¢
" " in oil	9 @ 12 @ 15¢
Vermilion, Chinese	90¢
" English	53 @ 58¢
" American, Common	15¢
White Lead, American, pure dry	6¢
" " " in oil	7 @ 7½¢
White Paris, English Prime	2 @ 2½¢
Yellow Ochre, French	$1.75
" in oil	asst'd cans, 11¢; kegs, 8¢
" Vermont	in casks, 1½¢
Yellow Chrome	17 @ 27¢
" in oil	14 @ 18 @ 20¢
Zinc White, American No. 1, dry	5 @ 6¢
" No. 1, in oil	7¢
" French (Paris Dry)	5½ @ 7½¢
" in oil	10 @ 11¢

Oils.

Bleached Whale, ₩ gal	52¢
" Sperm, ₩ gal	90¢
" Elephant, ₩ gal	60¢
Drilling	35¢
Valvone Cylinder	60¢
Engine	40¢
Fish Oil, Pressed	35¢
Lard, Prime Winter	57¢
" No. 1 Extra	50¢
Linseed, Raw, in casks and bbls	43 @ 44¢
" Boiled, " "	46 @ 47¢
" Western, "	41 @ 42¢
Calcutta	51 @ 52¢
Machinery	35¢
Miners' Oil	38 @ 35¢
Neatsfoot	60¢
Signal	50¢
Tallow	18¢
West Virginia	9 @ 15¢

Sundries.

Asphaltum, Cuban, ₩ lb	5½ @ 6¾¢
" Egyptian	5 @ 5½¢
Benzine	₩ gal. 8½ @ 9½¢
Chalk, ₩ 100 lb	40¢
" Block	75¢
Crucibles No. 14 and upward, per number	3¾¢
Grain Emery, 300 lb Kegs	4 @ 4½¢
Flour Emery, finest quality	2¾¢
Frostings	30 @ 35¢
Glue, White	24 ₩ 35¢
" Sheet	20¢
Glaziers' Points, Zinc, ₩ box	$4.75
Gum, Copal	30¢
" Damar	25¢
" Shellac, English	30¢
" " dark	25¢
Mineral Wool, ordinary, ₩ lb	1 @ 1¼¢
" extra	3 @ 3½¢
Pumice Stone, selected Lumps	3 @ 6¢
" powdered	2¼ @ 3½
Pine Tar, bbls	$2.25 @ $2.50
Pitch	$1.50
Plumbago E. L. Po., ₩ lb	4 @ 6¢
" American, ₩ lb	6 @ 10¢
" Gun Powder Glazing, ₩ lb	10¢
" Shot Polish ₩ lb	10¢
Putty, in bladders	2½¢
" in bulk	1¾ @ 2
Rosin—Common and Good—Strained	$1.85
" E & F	$1.40 @ $1.70
" G & H	$1.80 @ $2.25
" I & K	$2.50 @ $2.75
" M & N	$3.25 @ $3.50
Spirits Turpentine, ₩ bbl	36 @ 37¢
Stove Polish, Dixon's	₩ gross $6.50
" Rising Sun	" 5.50
" Gem	" 4.00
" Jet Black	" 3.00
Waste, No. 1 Cop	9¢
" No. 1 White Machine	9¢
" No. 2 White Machine	8½¢
" No. 1 Colored	6½¢
" No. 2 Colored	6¢
" Washed Machine	8½¢
Whiting, Spanish, ₩ 100 lb	60¢

NOVELTIES.

Patent Detachable Dash Reel.

The accompanying illustrations, Figs. 1 and 2, represent this article, which is made by the Indianapolis Mfg. Company, 79 South Pennsylvania street, Indianapolis, Ind. Fig. 1 represents it separately, and Fig 2 shows it attached to the dash. The object of this contrivance is to protect the leather from the constant wearing of the reins without the expense of welding a top rail on the dash frame. In fastening it on small bolts are used, the clamps slipping over the dash bars similarly to a whip-socket fastener. It is described as neatly plated and handsomely finished. Further advantages resulting from its use are the convenience in entering a vehicle of the handle attached to the rail, and the fact that from its style and finish it is an ornament to the buggy. The facility with which it can be attached is also specially alluded to. The manufacturers announce that they can furnish the rail for any size or shape of dash. The following directions for applying it are given: "Put the handles and rod together, as shown in cut, slip all the clamps over, press them up snug to leather and punch holes with an awl. Fasten the two center clamps first and then the end ones, and so on until finished. It is as easily applied as a whip-socket when understood. Apply rail before you put on the whip-socket. If the whip-socket is on, remove it until you apply the rail."

Fig. 1.—The S. & S. Patent Detachable Dash Rail.

Fig. 2.—Dash Rail Attached.

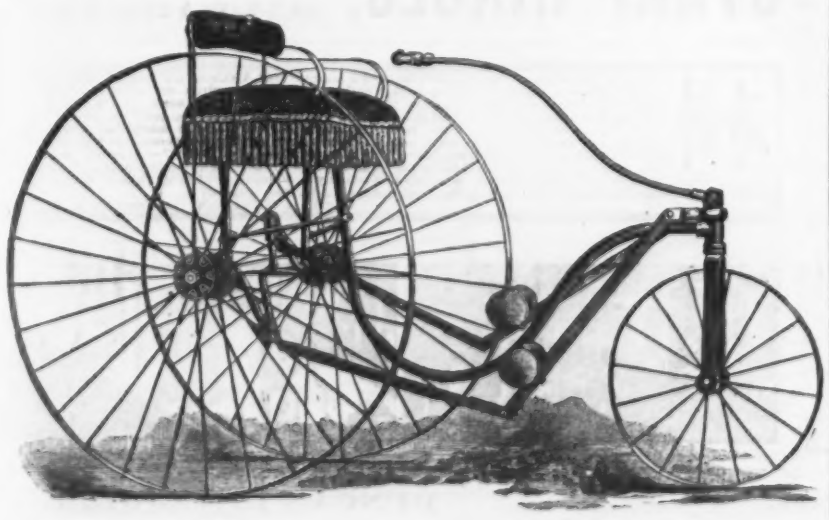
Blair's Adjustable Corn Husker.

The illustration given herewith represents this article, which is manufactured by E. Blair, Bucyrus, Ohio. The special features to which attention is directed by the manufacturer are that it is adjustable to fit any hand, and it is described as not making any part of the hand sore, while it can also be used over mitten or glove. It is made of steel and brightly plated, and furnished with strap complete.

Blair's Adjustable Corn Husker.

Fairy Tricycle.

The Fay Mfg. Company, Elyria, Ohio, are manufacturing this machine, which is represented in the illustration given below, which shows its construction and special features. The manufacturers call attention to the fact that the leverage is so applied that both levers cannot be on the dead level at the same time, and that each treadle communicates power for more than one-half of the revolution of the crank. That the frictional bearings are reduced to a minimum, making it to be an exceptionally easily running machine, is also alluded to. The axle is of cold-rolled steel, and will bear a weight of 200 pounds without bending, and the wheels are referred to as of the most approved pattern and latest make. The iron and steel are described as given a jet-black finsh, and the whole machine made with a view of withstanding the hard usage and wear that such a machine is liable to receive. The following points are also made in favor of these machines: Their durability and nonliability to get out of order; that the treadles are adjustable independent of each other, so that they can be made to accommodate cripples when one leg is shorter than the other; that the tendency of the action is to cause the rider to sit with body erect and shoulders back, instead of bending forward; that they are exceptionally comfortable and desirable for ladies' use, as they do not interfere with the clothing or expose the feet or ankles; that they are easily repaired in case of accidental breakage; that they are light for their size and strength, a 42-inch machine weighing only 70 pounds; that they are compact and narrow and so easily taken through narrow spaces where it is impossible for other machines to go, and that they are offered at a low figure. They are made with steel or rubber tires, with rear wheels 24, 28, 32, 36 and 42 inches.



The Fairy Tricycle.

The New Rapid Egg Beater.

The Standard Company, 129 Portland street, Boston, Mass., have added to their already large assortment of egg beaters the one named above and represented by the accompanying illustration, which sufficiently indicates in a general way its construction and method of operation. It will be seen that it differs from the usual make of cog-wheel beaters in being operated by a vertical motion, and that it is made entirely of wire. The manufacturers call attention to its simplicity and the fact of its satisfactory working.

The New Rapid Egg Beater.

The steamship Gothia, which arrived at New York last week, is the first of the new vessels of the Baltic Line of the Hamburg-American Packet Company to arrive at this port. She was named after the city of Gothenberg, in Sweden, at which the vessels of the line call. The other European ports which the Baltic Line steamers call at are Copenhagen and Stettin. The Macassar, a sister ship of the Gothia, will shortly be placed on the Baltic Line under the name of Slavonia.

MANUFACTURING.

Iron and Steel.

Gordon, Strobel & Laureau, Limited, of Philadelphia, have just closed through their Pittsburgh agents, Boyle and Bissell, a contract with the Old Dominion Iron and Nail Works of Richmond, Va., for a complete Bessemer plant consisting of one 3-ton converter with soaking pit, cranes, buildings, and, in fact, everything necessary to make the plant complete. The converter will be low blast and fitted with side-blown bottoms of the latest patterns. This contract is the fifth large steel-plant contract taken by Boyle & Bissell within the past 60 days.

The Hall Rolling Mill, at Hubbard, Ohio, was sold on the 21st inst. by the owner, Jesse Hall, to Henry O. Bonnell, W. Scott Bonnell and James L. Botsford, representing the Mahoning Valley Iron Company and Bonnell, Botsford & Co., of Youngstown, for $17,500. Nearly three years ago the present purchasers opened the mill for several months under a lease and offered Mr. Hall $35,000, but he refused to sell then for less than $40,000. Since then the mill has been idle, the owner running it for a short time at a loss. The plant consists of a muck mill, bar mill and 8-inch train, the machinery being in fair condition. The purchasers will at once commence making necessary repairs, and hope to have it in operation within 30 days.

The new tube works being erected at Youngstown, Ohio, by P. Matheson & Co., of Middletown, Pa., will be put in operation in about six weeks. Over 100 men are engaged in completing the plant. The works will be able to turn out wrought-iron pipe and tubes as large as 5 feet in diameter, whereas at present the largest wrought-iron pipe made is 16 inches in diameter. The product of the entire works will be 300 tons daily, and the mill will be the largest and finest in the world.

The Neo-Silicon Steel Works, at Sandusky, Ohio, which were erected in 1872 at a cost of $200,000, but which have been idle for the past two years, were totally destroyed by fire on the 18th inst.

Midland Furnace (charcoal), at Midland, Mo., which has been idle for some time making repairs, was blown in again on the 20th inst.

D. R. Lean, of Pittsburgh, has just contracted with the Indianapolis Rolling Mill Company, of Indianapolis, Ind., to build a complete Siemens-Martin steel plant. It will consist of two 20 ton converters, and will cost from $75,000 to $80,000. It will have a daily capacity of about 80 tons, and the output will be consumed by the company. Work will be commenced at once, and it is expected that the entire plant will be finished by the first of the year.

James Lappan & Co., of Pittsburgh, have received the contract for rebuilding the ironwork of the old Oliphant Furnace, in Fayette County, Pa.

Irondale Furnace (coke), at Irondale, Preston County, W. Va., which was closed down several months ago for repairs and enlargements, was started up on the 14th inst. The furnace turns out about 250 tons of foundry iron per week.

As predicted in these columns last week, the new Bessemer steel plant just erected by Jones & Laughlins, of the American Iron Works, Pittsburgh, made its blow of steel on the 19th inst. The test was highly successful.

Mr. Charles Parkin has received a patent for a compound ingot mold, and has assigned it to Miller, Metcalf & Parkin, proprietors of the Crescent Steel Works, Pittsburgh.

The new steel-rod mill recently erected by the Braddock Wire Company, at Braddock, Pa., was put in operation this week. This concern is the only one in the country that manufactures steel wire rods exclusively for the trade. The following are the officers: Wm. Edenborn, president; Wallace H. Rowe, secretary and treasurer, and Thos. W. Fitch, superintendent.

The nail strike which was inaugurated June 1, 1885, has come to an end, so far as Wheeling is concerned, by the offer of the nailers to resume work at the scale recently adopted at Pittsburgh. All the nail mills in that city are now in full operation.

The fly-wheel of one of the engines at the Bellaire Steel Works, Wheeling, W. Va., broke on the 18th inst., and the works will probably be idle for two weeks.

The puddlers in the Harrisburg district, which includes the counties of Northumberland, Dauphin, Perry and Lebanon, are demanding Philadelphia prices, or $4 per ton, after August 28. Those at Sunbury are out, their demand having been refused, and it is thought the Lebanon men will also strike.

Work was resumed at the nail factory of Chess, Cook & Co., Pittsburgh, this week.

On the 22d inst. the lining of the Girard Furnace, Youngstown, Ohio, which has been in steady blast for two years, caved in.

The Weymouth Iron Company (nail manufacturers), whose office is at No. 134 Milk street, Boston, and the plant at Weymouth, Mass, stopped payment and manufacturing August 20th. The trouble was brought about by losses caused by the flood last spring and the suspension of the Bridgewater Iron Company. The last certificate of the company was as follows: Assets, real estate, $70,000; machinery, $30,000; cash and debts receivable, $48,205; stock, material, &c., $121,967; profit and loss, $42,170; total, $312,342. Liabilities, capital stock, $150,000; debts, $162,342; total, $312,342. The officers claim that the company can pay its debts if the accounts can be collected.

Mine, Stack and Rail states that the blast furnace of the Colorado Coal and Iron Company has a capacity of 150 tons of iron per day. It is smelting Leadville and Villa Grove ore. The rail mill will be in operation some time next month.

Hardware.

In our market report of the 7th inst. we referred to the fact that the Southern Wire Company were preparing to manufacture wire nails, Mr. Gates having gone to Europe to purchase the necessary machinery. Since then the building contract has been let, and the new structure will be ready for the machines, some 45 in number, when the latter arrive from Europe in December. The building to be put up will be especially adapted to the new business, both in size and appointments, and will be practically fire proof. Barb-wire machinery may also be used in part of it. The new industry will greatly increase the magnitude of the Southern operations, and probably necessitate an increase of its force of hands to 250 or 300.—*St. Louis Age of Steel.*

A meeting of the National Nut and Bolt Manufacturers' Association was held at the Hotel Anderson, Pittsburgh, on the 17th inst. Representatives of 19 firms were present. Mr. A. S. Upson presided, and Mr. J. M. Hibbs, of Philadelphia, was secretary. No changes were made in prices, although this subject was discussed. The next meeting will be held in New York City, next month.

D. B. Rock, Fairfield, Adams County, N. Y., is the patentee of a new egg beater called the Monarch, the efficiency of which is referred to. It is not yet on the market, Mr. Rock desiring to sell the right or give it out on royalty to some manufacturer.

The American Cutlery Company, 177-191 Mather street, Chicago, are making a specialty of constructing light machinery for different purposes. This is a new feature of their business. Having just completed an order for 15,000 plug-tobacco cutters, they have commenced the execution of another order for 2000 automatic button-setting machines for a prominent house in the East.

The Fred. J. Myers Mfg. Company, Covington, Ky., among their more recent contracts report the following: Ironwork for the new 120-cell jail now being built at Savannah, Ga.; railing for the new truss bridge now being built over the Licking River, between Covington and Newport; ironwork for the new factory of Perkins & Campbell, saddlery. They state that they have sufficient orders upon their books to keep them busy for the balance of the year. Their wire-works department is also being worked to its full capacity. The company have just let the contract for building an addition to their present premises, measuring 31 x 190, two stories high, brick, which will be equipped throughout with new machinery. The addition will be used for the iron-works department.

Machinery.

The Midland Railway Company, of Colorado, are having 1000 freight cars built, all of which are to be equipped with the Westinghouse automatic freight brake. These cars are being built by the Terre Haute Car Works, of Terre Haute, Ind., and the Westinghouse Company are now at work on the order for the brakes.

The Allegheny County Motor Company, of Pittsburgh, were chartered on the 20th inst., with a capital of $10,000.

Among the orders recently shipped by P. Blaisdell & Co., Worcester, Mass., is a complete outfit of machinery for the new shops of the Somersworth Machine Company, Dover, N. H.

The Fisher Foundry and Machine Company, of Pittsburgh, have just completed two hydraulic presses, one of 65 tons, the other of 125 tons, capacity, to be used by the National Tubes Works for straightening pipe up to 24 inches in diameter. Also one hydraulic testing machine of 60 tons inside capacity for the same company. They have also set up and tested a gear molding machine, Mr. Simpson's patent, manufactured by the North Star Iron Works, of Minneapolis, Minn. This is the only machine of this pattern in the East, and the Fisher company are made the sole agents for it for Western Pennsylvania.

The D. E Whiton Machine Company, New London, Conn., incorporated June, 1886, have purchashed from D. E. Whiton the business of manufacturing the Whiton chucks, centering machines and gear cutting machines, together with the recently erected manufactory and equipment at that place, and will continue the manufacture of these tools. D. E. Whiton is president and L. E. Whiton secretary and treasurer.

The Holyoke Machine Company, Worcester, Mass., are employing about 30 per cent. more hands than last year.

The M. C. Bullock Mfg. Company, Chicago, Ill., report recent shipments as follows: To the Menominee Mining Company, Iron Mountain, Mich., one No. 16 portable Lane hoist, with two 10 x 15 engines and drum 54 inches diameter by 48 inches face; to the Chateaugay Ore and Iron Company, Plattsburgh, N. Y., one Challenge diamond prospecting drill for deep-hole boring, with complete outfit; one David Boyle patent 25-ton ice machine for Chicago parties; to the Lake Superior Iron Company, Ishpeming, Mich., one wrought-iron mining cage; to the Union Steel Company, Chicago, one No. 15 portable Lane hoist.

The George F. Blake Mfg. Company have completed a duplex compound condensing pumping engine of 2,000,000 gallons capacity for the Calais (Me.) Water Company.

W. C. Young & Co., makers of machinery, Worcester, Mass., have purchased the building No. 17 Hermon street, which was formerly occupied by the Taylor & Farley Organ Company, and have removed their business to that address. Currier & Snyder, formerly located at 131 Centre street, will have quarters in the same building. This firm make a specialty of upright drills.

The Curtis & Co. Mfg. Company, St. Louis, Mo., are meeting with very encouraging sales for their more prominent specialties. A partial list of their transactions in machinery the last few days is appended: Double sawmill for Illinois; single sawmill for Missouri; two Giant sawmills for Arkansas; two engines, also two boilers, for the same State; Giant sawmill, an engine and a boiler for Tennessee; lathe and bolter for Alabama; two lathes and bolters for California; planer for Tennessee.

The Valley Iron Works, Williamsport, Pa., have made arrangements with Tatum & Cowen, the largest and most extensive machinery dealers on the Pacific Coast, San Francisco, Cal., by which they are given control of the Valley automatic engine for that market.

The Gordon-Maxwell Company, Hamilton, Ohio, will furnish the pumping machinery for the new water works at Martin's Ferry, Ohio.

The L. W. Pond Machine Company is the name of a new company recently organized in Worcester, Mass., with a capital all paid in of $30,000. This company have bought out the tools and patterns of the Powell Tool Company and secured the same shops, and will enter largely in the manufacture of machine tools. L. W. Pond's name will sound familiar to those who were in the machinery business 10 to 15 years ago, at which time he was one of the best known tool manufacturers in New England. For a time Mr. Pond has been out of active business and now returns to the work. He is said to have some improved tools in his mind which the new company will make.

Hill, Clarke & Co., of St. Louis, Mo., report an excellent demand for the Bradley hammer.

Beaudry & Cunningham, Boston, Mass., report sales since August 1 of Beaudry hammers as follows: Milburn Mfg. Company, St. Louis, one; Niagara Stamping and Tool Company, one; Buffalo Hammer Company, Buffalo, N. Y., two; Railroad Velocipede Company, Kalamazoo, Mich., one; E. F. Carpenter & Co., Jamestown, N. Y., one, and Chas. Marchessault, Minneapolis, one.

Miscellaneous.

The Allegheny Illuminating Company is the name of a new organization recently formed at Pittsburgh for the purpose of furnishing natural gas for illuminating purposes. Alan W. Wood, of the firm of W. D. Wood & Co., is president of the company, which comprises a number of prominent natural-gas operators and business men, including the members of the Pittsburgh Supply Company. This latter organization is the owner of a series of patents covering a successful process of rendering natural gas an illuminant, giving it a slight odor, and to a large extent depriving it of its heating properties before it goes into the burners. It is understood that the capital stock of the new company is $100,000.

The removal of the mammoth Dueber Watch Case Mfg. Company, of Newport, Ky., to Canton, Ohio, which was noted by us some time ago, is now an assured fact. At a demonstrative public gathering held in Canton on the night of the 20th inst. Mr. Dueber personally accepted the $100,000 donation of the city, and was given the land selected by him for a site for his works. Architects and a master mechanic are already at work, and ground will be broken in a few days.

All the machinery, tools and stock of the Warren Fire Escape Company, late of Warren, Ohio, manufacturers of Johnson's patent portable and stationary automatic fire escape, have been removed to Baltimore, Md., where the manufacture will be continued with increased facilities under the name of the Warren Fire Escape Company, at No. 1 German street. This life-saving machine, which weighs only about 3½ pounds, is 4½ inches in diameter and 2 inches thick. It has phosphor-bronze works and a steel wire cable with a breaking strain of over 600 pounds.

The Pullman Car Company have purchased the plant of the Dure Car Mfg. Company, of Wilmington, Del. The consideration named in the deed of sale is $50,000. Thomas W. Bowers, of the former firm of Bowers, Dure & Co., the founders of these works, will represent the Pullman Company as superintendent. The company will vacate its Elmira, N. Y., works in October.

The Ohio Falls Car Works, at Jeffersonville, Ind., recently resumed operations after several years of idleness. Mr. Sprague, who has returned from Europe, was re-elected president, and Mr. J. L. Smyser vice-president. The shops and tracks have been overhauled and full forces are working on a number of their standard coaches. The company have just contracted for 200 freight cars for the St. Louis Air Line, which will start the works up in full operation, thus giving steady employment to hundreds of workmen. The car works have not been running on account of low prices, uncertain labor and general depression of business.

The St. Louis Steam Heating and Ventilating Company are about to make a number of improvements in their shop and power. Among other things they will put in a new 48-inch steel boiler and additional pipe machines. They are very busy both in and out doors. At Chattanooga they are just completing an opera-house contract for steam heating, and at Dallas, Tex., they have begun work on a similar contract.

During the week ending with and including Wednesday, the 18th, there was sent forward by lake from the mines of the Lake Superior region a total of 134,055 gross tons of iron ore, 33,310 gross tons of which went from Marquette, 44,205 tons from Escanaba, 2524 tons from St. Ignace, 38,526 tons from Ashland, Wis., and 16,390 tons from Two Harbors, Minn.

The addition to the manufactory and warehouse of the David Bradley Manufacturing Company, of Chicago, will probably be completed in 30 days. The company are making preparations to manufacture new square-corner, sulky and gang plows.

The first Russian tank steamer for carrying petroleum on the Caspian Sea was built in 1879. There are now 100 steamers and 300 sailing vessels.

Exports.

The following list embraces the Exports of Hardware, Machinery, Iron, Metals, &c., from the port of New York, for the week ending August 24, 1886:

	Quan.	Val.
Dutch West Indies.		
Dies, case	1	$15
Clocks, cs	3	38
Grindstones	20	11
Tar, bbl	1	3
Rotterdam.		
Pumps, pkgs	9	354
Hdw., cs	54	727
Ag. imp., pkgs	3	99
Mach'y, pkgs	3	510
Hamburg.		
Mach'y, pkgs	14	1,817
Firearms, cs	4	2,650
Surgical instru'nts, case	1	40
Copenhagen.		
Mf. iron, pkgs	11	250
Bremen.		
Crucibles, pkgs	9	300
Mf. iron, pkgs	21	492
Guns, cs	2	275
Gas fixtures, cs	41	1,425
Ag. imp., pkge	1	90
Cutlery, cs	4	50
Mach'y, pkgs	11	1,215
Hdw., pkgs	20	240
Gottenburg.		
Electric matl., case	1	225
Ag. imp., pkge	1	63
Hdw., case	1	7
Antwerp.		
Iron drums	50	580
Electric matl., cases	42	710
Sew. ma., cs	85	2,185
Firearms, cse	1	450
Zinc ore, cks	485	6,100
Hdw., cs	6	240
Stockholm.		
Electric matl., case	1	30
London.		
Hdw., pkgs	159	5,339
Ag. imp., pkgs	45	742
Saws, case	1	14
Cartridges, cs	27	615
Sew. ma., cs	487	12,413
Typewriters, pkgs	2	150
Refrigerators	20	204
Freezers, case	1	17
Graniteware, cases	6	357
Mach'y, pkgs	36	4,344
Ox. zinc, bbls	100	797
Mf. iron, pkgs	2	65
Electric matl., pkgs	9	1,151
Glasgow.		
Mf. iron, pkgs	16	540
Pumps, pkgs	4	250
Cartridges, cse	1	18
Hdw., pkgs	15	251
Sew. ma., cs	248	4,422
Ag. imp., pkge	1	8
Mach'y, pkge	1	75
Hull.		
Mach'y, pkgs	14	2,400
Hdw., cs	478	6,782
Ag. imp., pkgs	2	50
Pumps, pkgs	9	435
Liverpool.		
Mf. iron, pkgs	27	158
Ag. imp., pkgs	5	102
Copper matte, sacks	6482	41,055
Saws, case	1	89
Electric matl., cases	3	100
Firearms, cs	2	135
Mach'y, pkgs	174	7,659
Hdw., cs	65	1,903
Pumps, pkgs	7	176
Guns, cs	50	1,126
Sew. ma., cs	448	7,803
Tin boxes, cs	2	32
Swansea.		
Z. ashes, bbls	160	1,232
Canada.		
Sht. iron, pkgs	110	1,232
Newfoundland.		
Mf. iron, pkgs	88	391
Hdw., cs	3	170
British West Indies.		
Ag. imp., pkgs	12	113
Nails, kegs	131	333
Saws, case	1	11
Scales, cs	7	178
Mach'y, pkgs	8	316
Sew. ma., cs	41	756
Pumps, pkgs	4	73
Hdw., pkgs	20	216
Mf. iron, pkgs	33	214
Iron safe	1	62
Tinware, cs	6	128
Light-rods, cs	2	60
British Australia.		
Ag. imp., pkgs	8	289
Hdw., pkgs	75	1,180
Wheels, cs	2	49
Mf. iron, pkgs	15	198
Nails, kegs	32	252
Wire cloth, case	1	55
Car-wheels	30	180
W. mills, pkgs	102	985
Clocks, cs	4	70
Scales, case	1	95
Eyelets, case	1	78
Mach'y, pkgs	4	217
Nova Scotia.		
G. fixt's, pkgs	3	301
Hong Kong.		
Hdw., cs	2	62
Cuba.		
Nails, pkgs	18	225
Mf. iron, pkgs	477	8,321
Cop gds., pkgs	9	786
Scales, cs	13	704
Spikes, pkgs	10	85
Cruc'les, hhds	3	94
Pumps, pkgs	3	635
Barrows	82	150
Railroad bars	500	829
Cutlery, cs	8	356
Rivets, kegs	7	48
Nails, kegs	239	640
Mach'y, pkgs	384	15,731
Hdw., pkgs	150	2,559
Grindstones	349	218
Clay retorts	6	300
Iron tubes	201	1,388
Lead pipe, cks	3	273
Ag. imp. pkgs	53	1,389
Wheels, pkgs	90	700
R. R. mat'l pkgs	23	1,044
S'dpaper, case	1	33
Boilers	4	9,705
Havre.		
Cruc'bls, pkgs	26	145
Copper, cks	306	38,250
Hdw., case	1	140
Sew. ma., cs	26	925
Mach'y, pkgs	2	160
Pumps, pkgs	7	275
French West Indies.		
Mach'y, pkge	1	$75
Venezuela.		
Scales, cs	4	122
Nails, cs	48	390
Nails, kegs	38	95
Mf. iron, pkgs	20	81
Nuts, pkgs	4	62
Mach'y, pkge	1	60
Tinware, cs	3	62
Hdw., pkgs	32	565
Sew. ma., cs	17	455
Ag. imp., pkgs	3	36
Pumps, pkge	1	23
Brazil.		
Hdw., pkgs	905	10,124
Cartridges, cs	54	1,229
Car-wheels	508	6,040
Mach'y, pkgs	31	840
Scales, pkgs	69	730
Nails, kegs	415	575
Iron safes	4	270
Brass goods, case	1	27
Tacks, cs	19	341
Pumps, pkgs	7	225
Per. caps, cs	2	38
Refrigerators, pkgs	20	139
Nails, cs	23	220
Stencils, case	1	50
Tinware, cs	18	306
Firearms, cs	29	3,010
Mf. iron, pkgs	356	2,157
Car. w tr. & a., pairs	12	205
Railroad mat., pkgs	4	900
Ag. imp., pkgs	127	1,946
Tacks, cs	10	169
Barrows	184	174
Sew. ma., cs	163	2,793
Cutlery, pkgs	247	3,844
Elec. light mat., pkgs	32	1,102
Saws, cs	3	73
Chili.		
Scales, cs	74	594
Hdw., pkgs	117	2,258
Firearms, cse	4	620
Ag. imp., pkgs	242	8,097
Cutlery, cs	37	628
Tinware, cs	4	158
Mf. iron, pkgs	35	422
S. m. needles, case	1	83
Cartridges, cs	4	69
Nails, kegs	340	750
Nails, cs	6	80
Saws, cs	2	92
Pumps, pkgs	2	50
Tel. mat., pkgs	22	125
Grindstones	20	11
Mach'y, pkgs	143	12,487
Peru.		
Mf. iron, pkgs	5	46
Cutlery, cs	11	157
Sew. ma., cs	12	80
Scales, cs	24	330
Hdw., pkgs	27	365
Tinware, case	1	35
Mexico.		
Nails, pkgs	43	126
Hdw., cs	11	1,044
Boiler comp., keg	1	94
Mf. iron, pkgs	81	536
Cartridges, cs	23	715
Mach'y, pkgs	28	1,260
Sew. ma., cs	146	2,246
Nails, cs	4	16
Mf. copper, cse	1	9
Tin plates, bxs	10	75
Tinware, cs	3	80
Ag. imp., pkgs	6	201
Snot, bxs	2	30
Tel. mat., cs	3	99
Cutlery, cs	36	1,045
Carbines, cs	2	276
Grindstones	80	82
Brass goods, case	1	158
Crystal tin, case	1	27
Firearms, cs	2	752
Japan.		
Mf. iron, pkgs	13	84
Hdw., cs	21	233
Scales, cs	15	421
United States of Colombia.		
Hdw. pkgs	146	2,910
Sew. ma., cs	219	4,888
Mach'y, pkgs	91	2,171
Ag. imp., pkgs	65	443
Mf. copper, cs	2	138
Per. caps, case	1	100
Fish hooks, case	1	68
Nails, kegs	89	110
Scales, cs	3	7
Saws, cs	2	91
Firearms, case	1	25
Pumps, pkgs	7	149
Elec. light mat., pkgs	13	123
Cartridges, case	1	34
Anchor	1	23
Mf. iron, pkgs	549	1,675
Cutlery, cs	84	1,468
Tinware, cs	12	215
Tacks, cs	3	62
Brass goods, cs	4	200
Nuts, pkge	1	18
Iron, pkgs	86	136
Mathl. insts., case	1	40
Tel. mat., pkge	1	281
Car springs, cs	2	335
Iron safes	2	287
Furnaces, hhd	1	45
Nails, cs	71	694
Central America.		
Nails, kegs	3	15
Firearms, cse	1	24
Tinware cs	3	180
Hdw., pkgs	57	938
Scales, cs	2	74
Cutlery, case	1	70
Carbon points cs	10	194
Sew. ma., cs	41	600
Mf. iron, pkgs	71	591
Copper kettle	1	206
San Domingo.		
Hdw., pkgs	17	286
Tel. mat., case	1	30
Iron, bdls	12	28
Nails, cs	2	17
Hayti.		
Mf. iron, pkgs	5	41
Mach'y, pkgs	9	228
Iron, bdls	28	31

Detroit.

CHARLES HIMROD & Co., dealers in Pig Iron, Detroit, Mich., report, under date of August 23, as follows: The market has been quite an active one during the past week, particularly with Charcoal Iron men, who have been somewhat excited over the anticipation of a very large purchase of Iron by a Malleable concern in Ohio. On just what basis this purchase was made it is not in our power to state at present. This will complete the large purchases of this year, and in looking back it would seem as though something like 40,000 tons of Charcoal Iron alone have been purchased during the past two months, and unless some unexpected supply springs up it does not seem possible that, should the demand continue, prices can fail to advance. The hardening in prices which we have noted will become more of a permanent thing, we hope. Besides this large purchase, there have been numerous small ones at about market rates as quoted. Sales of other grades of Iron have been small, and the Southern men particularly vary sometimes in price as much as $1.50 ₱ ton on the same grades, owing simply to the difference in the quantities they have sold. We should quote the market about as follows:

Lake Superior Charcoal, all numbers	$21.50 @ $22.50
Lake Superior Coke, All Ore	20.00 @ 21.00
Lake Superior Coke, Cinder Mixed	18.00 @ 19.00
Standard Ohio Blackband	20.00 @ 21.00
Southern No. 2	17.00 @ 17.50
Southern Silvery, Open	17.00 @ 17.50
Southern Silvery, Close	16.50 @ 17.00
Jackson County, Ohio, Silvery	18.00 @ 19.00
American Old Iron Rails	20.00 @ 21.00
Old Wheels	16.50 @ 17.50

Although it has not been openly shown, it is reported that Old Material shows slight signs of advancing.

Coal Market.

The Anthracite Coal trade is in somewhat better condition, there being more confidence in the future action of the Coal companies, who decided to place the September allotment at 2,750,000 tons. The *Coal Trade Journal* prints the following table of the production for the first seven months of the current year, the August and September allotments and the output of the corresponding months of 1884 and 1885:

	Tons, 1884.	Tons, 1885.	Tons, 1886.
January	1,899,572	1,641,803	2,338,271
February	1,892,687	1,767,707	2,385,028
March	1,881,463	2,025,790	2,759,391
April	2,828,209	2,336,223	2,194,726
May	2,628,142	2,439,765	2,253,639
June	2,029,179	2,490,032	2,592,318
July	2,662,615	2,801,006	2,433,348
August	3,552,410	3,023,910	2,500,000
September	2,677,890	3,259,183	2,750,000
Total	21,962,167	21,785,421	22,206,724

The boatmen's strike, which still continues, has been the source of some embarrassment, and has led to slightly better prices for spot Coal. Through various channels, however, there is enough forthcoming to avoid actual scarcity. The strike is causing a blocking of cars, which is causing annoyance to shippers. All the principal points in the boatmen's controversy have been conceded, the men abandoning the demurrage clauses, while the shippers are willing to give the advance. The only point at issue now is the demand on the part of the men for annual contracts.

There is some talk of a small advance on Coal on the 1st of the month.

We quote for free-burning Coals, f.o.b. New York: Broken, $3.25 @ $3.30; Egg, $3.35 @ $3.40; Stove, $3.70 @ $3.75; Chestnut, $3.25 @ $3.30, and Pea, $1.90 @ $2.

The Bituminous Coal market is quiet at $2.90 @ $3 for Clearfield and equivalent grades, and $3.10 @ $3.25 for Cumberland Coals.

Progress in Bridge Building.

In his address before the convention of the American Society of Civil Engineers, at Denver, President Flad spoke as follows on modern progress in bridge building:

The greatest activity in any branch of civil engineering during the past year seems to have prevailed in bridge construction. Quite a number of important bridges have been completed, among them the bridges across the Susquehanna River, on the Baltimore and Ohio Railroad, 6315 feet in length, and having four spans of 480 feet and one of 525 feet; the Henderson bridge across the Ohio river, 3200 feet in length, with one span of 525 feet; and the St. John's River cantilever, 447 feet between the piers, and the bridge across the Big Black River. Of large bridges in course of construction the most important is the Forth bridge, with two spans 1700 feet each, and the Sukker bridge across the Indus, having a span of 790 feet; and finally the Lachine bridge on the Canadian Pacific Railroad, with two spans of 408 feet. The contract for the erection of a bridge at Hawkesbury, New South Wales, has lately been awarded to one of our American bridge companies, a very gratifying fact when it is considered that the contract was obtained in competition with the bridge companies of England and France. The main difficulty to be overcome in the construtions of this bridge lies in its deep foundations, which are to be sunk to a depth of 170 feet below the surface of the water.

The extremely low price of iron and steel greatly favors the selection of long spans for bridges, as the saving in piers and foundations balances the extra cost (per lineal foot) of long spans. The tendency among the bridge engineers at present seems to be favorable to the selection of systems in which the strains to which any member may be subjected can be accurately determined by calculation, and the use of the pin joint, which may be called a distinctive feature of American bridge construction, favors the attainment of this object. The rapidity with which bridges with pin joints can be erected is an immense advantage, particularly when material for such bridges has to be prepared at a great distance from its final destination, or when erection must take place where no facilities for doing ironwork exist. The system of construction is therefore particularly adapted for new and thinly settled countries. Since the great success of the cantilever bridge at Niagara Falls, a number of other bridges have been built on this principle. Indeed, by far the greater number of long-span bridges lately proposed are to be cantilevers, as this system offers great advantages in erection. But they are subject to greater deflections than those built on other systems, and I believe that the arch might in many cases be preferable, as it gives almost the same facilities for erection and is less deflected under the action of a moving load. I am glad to see the arch proposed in a late design for the Harlem River bridge.

The works of Robert Hooke, published in 1664, contain the following passage: "And as glasses have highly promoted our seeing, so it is not improbable but that there may be found many mechanical inventors to improve our other senses of hearing, smelling, tasting, touching. It is not impossible to hear a whisper a furlong's distance, it having been already done; and perhaps the nature of the thing would not make it more impossible though that furlong should be ten times multiplied. And though some famous authors have affirmed it impossible to hear through the thinnest plate of Muscovy glass, yet I know a way by which it is easy enough to hear one speak through a wall a yard thick. It has not yet been thoroughly examined how far otocousticons may be improved, nor what other ways there may be of quickening our hearing or conveying sound through other bodies than the air, for that is not the only medium. I can assure the reader that I have, by the help of a distended wire, propagated the sound to a very considerable distance in an instant, or with as seemingly quick a motion as that of light, at least, incomparably swifter than that, which at the same time was propagated through the air, and this not only in a straight line, or direct, but in one bended in many angles."

Experience has proved that the least practicable distance to which power may be transmitted economically by means of a wire rope is about 50 feet.

CONTENTS.

THE WEEK.

The present strength of the United States navy is about 100 vessels, of which 19 are ironclads. Five of these are new double-turreted monitors, and the rest, with some repairs, might be made serviceable for harbor defense. All other vessels are wooden except six. All of the Roach ships will be ready for service soon except the Chicago, which is in the yard at Chester, as is also the Boston. The Atlanta and Dolphin are in commission.

The first iron sailing vessel ever built in this country was the schooner Mahlon Betts, which was constructed at the shipyard of Pusey & Jones, Wilmington, Del., just previous to 1850. She is now the Clyde Line steamer J. W. Everman, and is laid up at Cramps' shipyard. The iron bark Iron Age was built by the Harlan & Hollingsworth Company soon after the Betts was launched, but she afterward capsized in a squall and became a total loss. Among some of the old iron steam vessels at present in active service, and which are entirely American both in construction and material, are the following: Steamer John A. Warner, built in 1856, which is now running as an excursion boat; steam propeller W. Whilldin, built in 1845, at present running between Philadelphia and Baltimore; the Hudson River excursion boat Richard Stockton, built in 1851.

The phosphate industry of South Carolina, which was scarcely known 15 years ago, is now sometimes spoken of as the salvation of the State. Steam dredges excavate the rock from the bottom of the rivers. On the banks are located the trestles, tramways and machinery for washing and drying. A correspondent says: "The supply of really valuable phosphate rock was supposed to be limited at first. Then came the boom which is now in full sweep. Phosphate is dug out of the Ashley, the Coosaw and the Beaufort rivers. Improved processes develop the value of deposits which five years ago were considered worthless. Northern and English capitalists have come, and there has been infused into the industry a degree of energy that native South Carolina admires, if it does not imitate. Iron-bound cash-boxes, heavy with silver, go down by the boat with weekly regularity to the works. Black labor, in long files, marches by the cashiers every Saturday night."

Large transfers of real estate have recently taken place on the water front at Greenville, N. J. The truth, so far as it can be gathered from contradictory reports, appears to be that parties whose names do not yet appear in public prints are organizing on a plan similar to that of the Long Dock Company, of Jersey City, and that ultimately the Baltimore and Ohio Railroad Company, and perhaps the Lehigh Valley and others, will share in the terminal advantages thus secured. The improvements contemplate extensive piers in deep water, with passenger stations and ferry-houses, the entire tract filled in and reclaimed comprising about 750 acres.

The reports of the Naval Board of Inspectors instructed to ascertain what particular vessels in the mercantile marine might be utilized for war purposes in case of emergency represent that the iron steamers Louisiana and New Orleans, of the Cromwell Line to New Orleans, might be easily converted into fast-sailing cruisers, superior to many of the first-class foreign vessels employed in naval service.

The yards of William Cramp & Son, Philadelphia, are working with a full force of men, fully 1800 hands being on the pay-roll. This is more, it is said, than has been employed there at any time since the Russian war vessels were fitted out several years ago. Four new steamers are at the yard, one ready for a trial trip, and the others scarcely begun, while four vessels are undergoing repairs. The new iron steamship Seminole, now building at the yard for William P. Clyde & Co., will soon be launched. The steamship Cherokee, building for the same firm, will be launched shortly after. Work has also been started on a new vessel for the Metropolitan Steamship Company for service between New York and Boston. The new Morgan Line steamship El Monte, built by the same firm for service in connection with the Southern Pacific Railroad system, recently made a trial trip. A large fleet of vessels is also undergoing repairs at the yard.

A collision occurred on the Camden and Atlantic Railroad at the little station of Ancora, 23 miles out from Camden, in which eight persons were injured.

The new French steamship La Bretagne arrived at New York on the 22d inst., after a quick, although rather stormy, voyage. Captain De Jousselin reported that the vessel had behaved admirably throughout the voyage, which she made in about 8 days and 9 hours. La Bretagne measures 7000 tons. Her dimensions are: Length, 508½ feet; breadth of beam, 51½ feet, and depth of hold 31½ feet. She was built in the yards of the steamship company at Penhoet, near St. Nazaire, on the River Loire. The hull is of steel, and the wood used is Canadian elm and teak. The water-tight bulkheads are 11 in number, and extend from the keelson to the second deck. The engines are of the triple-expansion style. La Bretagne cost the General Transatlantic Company $1,700,000, exclusive of her decorations, which were done by the company's employees at an expense of $75,000.

The horse cars on Broadway, Seventh avenue and University place, New York, were tied up August 23. The source of the trouble was a new time schedule which increased the number of trips made by each car per day.

A dispatch from Shanopin, Pa., says the Marks oil well, after being drilled 12 feet in the sand, started to flow at the rate of 2500 barrels a day. Shanopin is 16 miles below Pittsburgh, and this is said to be the largest well ever struck in the vicinity.

The new treaty with Spain affecting American trade bears date February 13, 1884, and has been published in Havana by royal order. The treaty stipulates that American vessels in direct commerce with Cuba and Puerto Rico shall be placed upon the complete footing with those navigating under the Spanish flag in the carrying of the products of the United States, as well as all merchandise proceeding from the same.

The Government has closed a contract with the Pacific Mail Steamship Company to carry the mails from New York to Panama, Central and South America for the amount of the inland and sea postage, and from San Francisco at the same rates to ports on the Pacific Ocean, to go into effect September 1.

Mexican papers have frequent reference to the financial improvement taking place in that country. The *Financier* says: "The heavy investments made of late by European capitalists in Mexican lands, and the continued demand for good agricultural properties on the part of investors abroad, strengthen the conviction that the tide is turning and that better times are ahead."

The Industrial Union is the name of the independent movement in politics which has its central organ in Washington, called the *National View*. The peculiarity of this organization will be that it is not intended to have subordinate State organizations. It is proposed to organize in each Congressional district and then to have the district officers report directly to the central officers in Washington. The organized forces of the independent movement are stated by Col. Lee Crandall, the editor of the *National View*, to be the trades unions, the Knights of Labor, the Agricultural Wheel, with headquarters in Arkansas and subordinate lodges in nearly all the Southern States, the Farmers' and Laborers' Co-operative Union of Kansas, Iowa and Missouri, the National Homesteaders of Maryland, Virginia and West Virginia, and the Knights of Industry of Boston and the New England States. Then there are the so-called National Greenback Labor party, the Progressive party, the Income Tax party and the Industrial League. The object of the proposed Industrial Union, with headquarters at Washington, is to afford an opportunity for those who do not desire to join any of the above-named secret organizations to co-operate with them in the attempt to destroy the two great political parties and to assist in the dissemination of information for this purpose.

A notable advantage which the chief European cities have over most American cities is the method followed in using the streets for railway purposes. A style of rail is laid that offers advantages both to the railroad company and to the owners of ordinary wheeled vehicles. The iron is molded as a broad flat bar or slab of about 6 inches width and 1½ inches thickness. The upper side is slightly crowned or rounded, and midway along it is a concave groove of about ⅝ inch depth and ⅞ or 1 inch width. This groove takes the flange of the car-wheel, and the tire or broad part of the wheel runs upon the upper surface of the rail. An important part of the method is in having the rail the full breadth of the upper edge of the timber on which its rests. This permits the paving blocks to be crowded up against the edge of the rail.

Skidding logs with steam in the lumber regions of Wisconsin is described by a local editor, who says: "It is a great sight to witness two or three huge logs being dragged from a distance of 35 rods over brush, fallen trees, stumps, &c., as if they were mere sticks, and dumped on top of a huge pile alongside of the track. And to do all this requires only one man to manipulate the levers on the steam engine, and one way off where the logs lie, to put the chain around them. It makes no difference if the logs to be drawn are beneath a pile of other logs or fallen trees. The moment the chain is put around them off they go, the forward end somewhat elevated and the rear end dragging over any obstruction in the way. Sometimes the whole load makes a leap of several rods without touching the ground."

James T. Nulty, a Pittsburgher of an inventive turn, has just got a patent on an improved railroad spike, which, it is claimed, will make a big change in railroad construction. It consists of a headless spike made of open-hearth steel, and perfectly straight at either end, with a shoulder in the middle, which, when the spike has been driven into the tie, clasps the base of the track. The top of the spike is then bent over by means of an iron bar invented for the purpose, until the top of the spike is bent under the cap of the rail, where it prevents the rail from creeping, spreading or turning. The spike is especially adapted to curves, and in lonely sections and isolated places requires no attention when once placed in position. The same bar used to bend the spike is also employed to extract it after it has been rebent to a perpendicular position. Another advantage claimed is that in case the rail should have to be removed the spikes can be bent at such an angle as desired without withdrawing them, and after the rail has been replaced they can be bent back to their original position, thus saving time, material and labor.

A proposed extradition treaty with Japan, signed at Tokio last April, will be acted on by Congress at its next session.

It is estimated that to build the section of the Mexican National Road, now uncompleted on the main line, extending some 362 miles between Saltillo and San Miguel de Allende, will cost $5,000,000, and to construct the branch from Lampasos to the Sabinas coal fields will require $1,000,000. A total of $8,000,000 would render the National system practically complete.

The one place in the country where the most railroad trains pass is said to be the Union Depot, Elizabeth, N. J. A man was put on for the purpose last week and counted up 3255 as the total, and in one day of 24 hours 600. It is a crossing at the street level, too.

It is remarked with some appearance of truth that the newly chartered English company, with its bank and capital of £2,000,000, at the seat of government in Madagascar, will do more in one year to make the island English than French admirals and French powder and French treaties have done to make it French during the last ten years.

Barbed-wire fencing has been smuggled into Canada from Detroit by men who were ostensibly hauling water from the river for irrigation, but the supposed empty barrels used were sunk in the river and taken away at night by vessels employed for the purpose, to recover the wire which they contained.

A workman in Anderson & Du Puy's steel mill, in Pittsburgh, was drawn into the rolls and passed through a space not exceeding 2½ inches. Every bone was broken.

A new basting machine capable of doing the work of 25 girls is being used experimentally by a large clothing firm in Boston, and the Knights of Labor are giving it their attention.

The National Board of Steam Navigators, to convene at the Hoffman House, in this city, September 1, has been largely reinforced in its membership and is entitled to rank as a large and influential body representing the vessel owners of the United States.

An explosion of flour dust took place in the milling machine of M. Bullowa, in Washington street, this city, and caused damage to the extent of $8000.

Capt. J. W. Miller was recently appointed general manager of the Providence and Stonington Steamboat and Railroad Company, as successor to the late Captain Babcock.

A fire in San Francisco on August 21 destroyed property valued at $2,000,000.

The dismantling of the Columbia bridge over the Schuylkill, the first railway bridge of considerable size built in the United States, is a reminder of the progress made in transportation since it was erected, in 1834. Then freight from Pittsburgh to Philadelphia was sent largely to canal-boats made in sections. At the termination of the water routes the sections were detached with their burdens, and upon trucks, loaded on cars, and thus carried over the old bridge into Philadelphia.

A disastrous series of storms which visited Galveston and other Texan cities last week resulted in the destruction of property valued at $500,000.

Mr. William H. Stevenson, superintendent of the New York, New Haven and Hartford Railroad Company, is reported to have said that the work of laying a double track through Bridgeport will soon be commenced. This improvement, which will be completed before winter, will prove to be a great benefit, as it will lessen the frequency of delays, and will allow the trains to make their schedule time.

The decline in the shipbuilding interests of the United States, noticed for so many years, at last appears to have been arrested. The Commissioner of Navigation is now engaged in compiling the shipbuilding statistics for the last year, and from the results already reached forms the opinion that the aggregate tonnage built in the United States during 1886 will be shown to have been fully equal to that for the fiscal year 1885. The increase in the number and tonnage of iron ships built continues steadily, but it is not sufficient to affect the continued decline in wooden shipbuilding. The tonnage of iron vessels constructed, which was 25,582 tons in 1880, 28,392 in 1881, 40,097 in 1882, 39,646 in 1883, 35,631 in 1884 and 44,028 in 1885, will show further increase, probably in as large proportion as the increase of 1885 over 1884. The decline of the tonnage of wooden vessels constructed will be more rapid than heretofore.

THE IRON AGE BOOK DEPARTMENT.

Iron, Steel and Metallurgy.

Greenwood.—Steel and Iron. Comprising the practice and theory of the several methods pursued in their Manufacture, and of their treatment in the Rolling Mill, the Forge and the Foundry. By W. H. Greenwood; 97 illustrations, 536 pages, 12mo, cloth. . . $2

This work satisfactorily presents in convenient form the most important processes employed in the manufacture of iron and steel. The illustrations are in most cases reduced from actual working drawings. The style is simple and clear. Although many of the recent improvements in American practice have not received the thorough attention which they merit, the book treating more particularly of English practice, the author has succeeded in producing a comprehensive manual for the technical student, and an intelligible and valuable assistant to the practical iron-worker. The chapter headings are as follows:

Explanation of Terms; Refractory Materials, Crucibles, &c.; The Ores of Iron; Metallurgical Chemistry of Iron; Cast or Pig Iron; The Production of Pig Iron; The Blast Furnace; Hot-Blast Stoves, Hoists, Lifts, &c.; Fuel, Blast, Charges, Yield and Waste Gases of the Blast Furnace; Castings in Iron, Foundry Appliances, &c.; Malleable or Wrought Iron; The Production of Malleable Iron Direct from the Ore; Indirect Methods for the Production of Malleable Iron; The Production of Malleable Iron in Open-Hearth Furnaces; Refining of Pig Iron; Pudddling; Mechanical Puddling and Rotary Puddling Furnaces; Forge and Mill Machinery, Furnaces, Plant, and Operations; Steel and Ingot Iron; The Methods Employed in the Production of Steel Direct from the Iron Ore and by the Carburization of Malleable or Bar Iron, by the Decarburization of Pig Iron in the Finery or in the Puddling Furnace, by the Fusion of Pig Iron with Malleable Iron or with Iron Ores in the Open-Hearth Steel-Melting Furnace; The Bessemer or Pneumatic Process for the Production of Steel from Pig Iron; The Basic Process for the Conversion of Phosphoric Pig Iron into Steel in the Bessemer Converter; The Production of Homogeneous Steel Ingots, Fluid Compression of Steel, Compound Armor Plates, &c.

Kunhardt.—The Principles of Ore Dressing in Europe. By Wheaton B. Kunhardt M. E.

A description of foreign methods for the mechanical concentration of ores. The various operations of sizing, sorting, cleansing and separating ores by hand and by machines, and the methods employed in the prominent European works, are explained. To mining engineers the book should prove of special interest as showing the recent improvements and great developement in the mechanical treatment of ores during the past few years.

Bell.—Principles of the Manufacture of Iron and Steel, with Some Notes on the Economic Condition of Their Production. By I. Lowthian Bell, F.R.S.; 10 full-page plates, 744 pages, 8vo, cloth. $6

This extended and comprehensive treatise is an outgrowth, as stated by the author in his introductory chapter, of a request, from the British Iron Trade Association, to prepare a report on the present condition of the manufacture of iron and steel as illustrated by the objects displayed at the French International Exhibition of 1878, in Paris. This work contains not only the general results then arrived at, but also more extended investigations and experiments which it was considered necessary to pursue to thoroughly discuss the subjects under treatment. The appended headings of the 18 sections into which the volume is divided will give an idea of its scope:

SectionI. Introductory. Section II. Historical. Section III. Direct Processes Preliminary Treatment of Materials for the Making Malleable Iron. Section IV. for Blast Furnace. Section V. The Blast Furnace. Section VI. On the Use and Theory of the Hot Blast. Section VII. On the Quantity and Quality of the Fuel Required in the Blast Furnace U sing Air of Different Temperatures. Section VIII. On the Solid Products of the Blast Furnace. Section IX. Chemical Changes as They Take Place in the Blast Furnace. Section X. On the Equivalents of Heat Evolved by the Fuel in the Blast Furnace. Section XI. On Hydrogen and Certain Hydrogen Compounds in the Blast Furnace. Section XII. On the Production of Malleable Iron from Pig Iron in Low Hearths. Section XIII. On the Refining and Pudd'ing Furnace. Section XIV. On More Recent Methods of Separating the Substances Taken Up by Iron During Its Passage Through the Blast Furnaces. Section XV. Statistical. Section XVI. British Labor Compared with That of the Continent of Europe. Section XVII. On Labor in the United States of America. Section XVIII. Chief Iron-Producing Countries Compared.

Bauerman.—Metallurgy of Iron. By H. Bauerman; 5th edition, revised and enlarged, 58 illustrations, 515 pages, 12mo, cloth . . . $2

This work treats of the physical properties of iron ores, and the most approved means of reducing them to the purposes of the manufacturer. The methods of assay and analyses of iron ores are practically considered, as also their composition and distribution. The subject of blast furnaces, their capacity and production, has also received careful attention. In the present edition the author has added to the chapter on Steel Making, and has explained and illustrated the progress recently made in the process of steel manufacture, both of Siemens and Bessemer, especially the latter, by the adoption of lime as a dephosphorizing agent. The book also contains a chapter on the mechanical properties and tests of Malleable Iron and Steel. The author has succeeded in his avowed attempt to supply much practical and reliable information for ironworkers and others, in condensed form.

Thurston—Materials of Engineering. By Robert H. Thurston, C. E., Professor of Engineering, Stevens Institute of Technology.

Part II, Iron and Steel; 143 illustrations, 680 pages, 8vo, cloth 1883 . . . . . $5

In this, the second volume of Professor Thurston's important work on the materials of engineering construction, the author has included a large amount of practical information not heretofore available without consulting many different authorities. The ores of iron, their classification, analysis and reduction have received thorough treatment. The construction and management of blast furnaces and the different operations connected therewith are comprehensively detailed. The subject matter comprehends all the practical operations employed in the manufacture of iron and steel, so simply expressed as to be readily understood by those of limited education. There are several chapters upon the strength, elasticity and resistance of the metals treated, under the effects of time, temperature and repeated strain, with the necessary formulæ and diagrams. The work is valuable not only as a text-book for the student and engineer, but equally so as a work of reference for the manufacturer and mechanic. Considerable space is given to the most approved methods of manufacturing malleable iron, and the tests of iron and steel are carefully considered and illustrated by recent examples.

Gruner.—The Manufacture of Steel. By M. L. Gruner; 9 plates, 196 pages, 8vo, cloth; . $3.50

In this translation from the French, the author critically considers the nature of steel, the methods of fining pig iron, and describes the theory and manufacture of steel by cementation and the Bessemer process in all the countries of Europe. There is also an appendix by the translator, Lenox Smith, on the Bessemer process in the United States.

Percy.—*Manufacture of Russian Sheet Iron.* By John Percy; 12 illustrations, 23 pages, 8vo, pamphlet; . . $0.50

This little pamphlet, by a well-known English author, consists chiefly of a description of various methods of making sheet iron as practiced by Russian engineers. The information is very complete, considering the size of the work, and there is an appendix upon the manufacture of American sheet iron.

Casting and Founding.

West.—American Foundry Practice. By Thomas D. West; illustrated, 391 pages, 8vo, cloth $2.50

A practical treatise on the management of cupolas and the melting of iron. The author, a practical foundryman, treats of the molder and his trade, green-sand molding; loam and dry-sand molding, and the manipulation of iron castings. The work is a valuable addition to the list of books upon this subject.

West.—Moulder's Text Book; being Part II of American Foundry Practice. By Thomas D. West; 146 illustrations, 461 pages, 8vo, cloth. - - - - - $2.50

This volume, in connection with the author's previous work entitled "American Foundry Practice," affords a thorough presentation of the latest and best methods of foundry practice. Beginning with articles on sound casting and defects in structural castings, the various chapter headings include Progress in Molding; Novelties in Foundry Practice; Geometry in the Foundry; Procuring Clean-Finished Castings from Dry Sand and Loam Molds; High Art Molding in Loam and Dry Sand; Manipulating of Cores; Procuring Clean-Finished Castings from Green Sand Molds; Methods and Rules for Green Sand and General Molding; Elements and Manufacture of Foundry Facing; Welding Steel to Cast Iron and Mending Cracked Castings; Foundry Addition; Ovens and Pits; Ladle and Casting Carriage Combined; Making Chilled Rolls and Roll Flask, Runners and Gates; Molding Machines; Equivalent Areas for Round, Square and Rectangular Pouring Gates; Errors in Figuring Weights of Castings; Utilizing Cast Steel Scrap; and several contributed chapters on melting small quantities or iron, making a curved pipe from a straight pattern, making pipes on end in green sand, three ways of making an air vessel and a method of molding gear-wheels. The subjects of Cupolas and their Construction, and the Melting of Iron, are extensively treated. There are also included 46 reports of cupola workings collected from 30 States. Each firm's name and the line of castings made are given, making these reports valuable in giving so many different men's ideas and practice in mixing and melting iron.

Larkin.—The Practical Brass and Iron Founder's Guide. By James Larkin; 5th edition, revised, 301 pages, 12mo, cloth; . $2.25

A concise treatise on brass founding and molding by a practical founder. The properties of metals and their alloys are discussed with special reference to their use in bell and gun founding, and in casting and manufacturing statuary, medallions and various other articles used in the industrial arts and for ornamentation. Useful recipes for tinning, japanning and varnishing brass, iron and other metals are given, and there are brief remarks on the manufacture of iron and steel.

Spretson.—Casting and Founding. By R. E. Spretson; 2d edition with 82 plates drawn to scale 412 pages, 8vo, cloth. London . . . . . $

The object of this work has been to collect in one volume every subject on which a founder will require information. It embraces a full discussion of modern English and Continental practice in casting, founding, molding and case-hardening iron, steel, brass, bronze and other materials a founder may have to deal with. The illustrations show working drawings of cupolas, furnaces, blowing engines and all the machinery necessary to the art. The methods of founding statues, bells and articles used for art work and ornamentation are practically described

Wylie.—Iron Founding. By Claude Wylie, with diagrams; 164 pages. 8vo., cloth. London, . . $1.40

This treatise is a record of the extensive experience of a practical iron molder who thoroughly understands his business, and who has expressed his ideas in a manner that commands attention. With the exception of quotations from the works of Bloxam and other authors on the properties of metals, the matter of this book is in a great measure original.

Mullin.—Modern Moulding and Pattern-Making; A Practical Treatise Upon Pattern Shop and Foundry Work. By Joseph P. Mullin, M. E.; 165 illustrations, 257 pages. 8vo, cloth. . . . $2.50

This book embraces the molding of pulleys, spur gears, worm gears, balance-wheels, stationary-engine and locomotive cylinders, globe-valves, toolwork, mining machinery and the latest improvements in English and American cupolas. A number of practical tables for general use are included, such as Tables of weights and measures of round, T and bar iron, and diameters, circumference and all circles, and of the proportional radii of wheels.

Assaying, Chemistry, Mineralogy.

Bayley.—The Assay and Analysis of Iron and Steel, Iron Ores and Fuel. By Thomas Bayley; 17 illustrations, 91 pages, 12mo, cloth. $1.40

This little book is a reprint, with some additions, of a series of articles which have appeared in the *Mechanical World* (England). It is intended for practical men possessing some knowledge of chemistry as well as for students of chemistry in general. The methods of analysis described have been personally tested by the author in his extensive practice. A table of the atomic weights as recalculated by Mr. F. W. Clarke is included

Ricketts.—Notes on Assaying and Assay Schemes. By P. De Peyster Ricketts, Ph.D., Instructor in Assaying in the School of Mines, Columbia College, New York; 6th edition, revised and enlarged, illustrated, 210 pages, 8vo, cloth; $3

A serviceable manual for the practical as well as the scientific student. It contains chapters on apparatus, reagents and operations, dry and wet assays, with tables and references, and an appendix on blow-pipe analysis.

Crown, Walter L.—Manual of Assaying Gold, Silver, Copper and Lead Ores. 318 pages, illustrated, 12mo, cloth; $1.75

This volume contains practical information to enable any one with a little practice to assay ores that are supposed to contain gold, silver, copper or lead. The book is comprised in three divisions. The first describes and illustrates all apparatus required; it also describes the reagents and how to prepare and test them. The second part is devoted to the assaying of the ores of the four metals mentioned. In the third part many special processes are included, as the assay of gold and base bullion, amalgamation, pan and chlorination tests, copper analysis, testing of minerals, &c. Useful tables of weights, and for reference a list of books bearing on geology, mineralogy, metallurgy, &c., are included.

Troilius.—Notes on the Chemistry of Iron. By Magnus Troilius, E. M.; 9 illustrations, 97 pages, 8vo, cloth. $2

Descriptions of such chemical methods of analysis of iron and steel as have come under the personal observation of the author in a successful practice make up the subject matter of this book. An introductory chapter discusses the distinctive properties of pig iron, wrought iron and steel, and the influence of the various elements usually combined and alloyed with the same. Chapter II is devoted to the analysis of wrought iron and steels, of pig iron, of spiegel and ferromanganese and of silicon iron. In Chapter III the determination of the most important ingredients in iron ores, slags, limestones, coal and coke is considered. The fourth and concluding chapter takes up the important subject of gas analysis. There are several appendices giving heat calculations, calculation of blast-furnace burden, table for rapid calculation of analysis, etching test, table of elements and tables of French weights and measures.

Fresenius.—A Manual of Qualitative Chemical Analysis. By C. R. Fresenius; translated into the new system by Prof. S. W. Johnson; pp. 438, 8vo, cloth; $4

Fresenius.—A System of Quantitative Chemical Analysis. By C. R. Fresenius; edited by Prof. O. D. Allen, assisted by Prof. S. W. Johnson; entirely new edition, revised and corrected, 883 pages, 8vo, cloth; . . . $6

In these translations from the well-known German author, the editors (Professors Johnson and Allen, of the Sheffield Scientific School) have judiciously omitted processes in the original works which their experience had convinced them were unnecessary. The books have been adapted to the wants of the American student without impairing their efficiency, and important new matter has been added, the new notation and nomenclature being employed throughout.

Erni.—Mineralogy Simplified; Easy Methods of Identifying Minerals, Including Ores; With an Introduction to Modern Chemistry. By Prof. Henry Erni; 2nd edition. revised and enlarged, 121 illustrations, 395 pages, 12mo, cloth. $3-

This work is based on Professor Von Kobell's Tables for the Determination of Minerals by means of the Blow-pipe, by Flame Reaction, by the Spectroscope and by Humid Chemical Analysis. The treatment of the various minerals, their physical and chemical properties, methods of testing and classifying, are described in detail. Considerable space is devoted to the characteristic behavior of the most important ores before the blow-pipe and with solvents

Dana.—A System of Mineralogy. By Prof. James D. Dana; 5th edition, with over 600 illustrations, including appendices by Profs. G. J. Brush and E. S. Dana, completing the work to 1882, making 1 vol. of 1044 pages, cloth . . $10

This work comprises the latest discoveries, and is unquestionably the most comprehensive and authoritative treatise on the science of mineralogy yet issued. It is regarded as a standard. This edition has been almost entirely rewritten and greatly enlarged, and will be found to be complete in design, detail and execution.

Electro-Metallurgy.

Watt.—Electro-Metallurgy. By Alexander Watt; new edition, enlarged, 195 pages, 12mo, cloth; $1

A practical work on the electro-deposition of copper, silver, gold, brass, bronze, iron and nickel, with details and processes carefully described. The present edition contains much new matter upon the deposition of nickel.

Urquhart.—Electro-Plating. By J. W. Urquhart; with numerous illustrations, 216 pages, 12mo, cloth. London, ... $2

Any ordinarily intelligent person may become skilled in the practice of electrotyping by consulting this practical handbook, which gives, in simple language, working directions for copper, silver, nickel and gold plates; with clear explanations of terms and tools dapted to the work.

Mechanics and Engineering.

Richards. — Treatise on the Construction and Operation of Woodworking Machines. By J. Richards; 283 pages, 4to, 117 plates, cloth. $6

This is the most important work upon the subject now in the market. It presents a history of wood-working machinery, and traces the progress of manufacturing all kinds of machines used in sawmills, planing mills and the like, from the earliest efforts of inventors to the present time. The engravings are of a high order of excellence, and show the practice of prominent mechanical engineers in England, France and America. The plan of the book is to notice in a general way the several leading operations in wood conversions, with the construction and operation of the machines in modern use introducing such rules and treating of such laws as have been fixed by experience. The author stands high as a mechanical engineer in both England and America. He was at the head of one of the largest and best-known establisements for the manufacture of wood-working machinery in this country for a long term of years.

Haswell.—Engineers' and Mechanics' Pocket-Book. 45th edition, entirely rewritten and enlarged, 922 pages, 12mo, leather, pocket-book form. $4

Containing tables, rules and formulæ pertaining to mechanics, mathematics and physics, including areas, squares, cubes and roots, logarithms, steam and the steam engine, naval architecture, steam vessels, mills, masonry, limes, cements, mortars, &c. The present edition is an entire revision of former ones. Much new matter has been added and the subects are well arranged and classified. The tables of areas, weights and measures, &c., have been extended and verified. A comprehensive orthography of technical words and terms is included, and a full index accompanies the book.

TRADE PUBLICATIONS.

Sand-Molding Machinery.

One of the neatest and most attractive catalogues that we have seen for some time has just been issued by the Peerless Manufacturing Company, of Louisville, Ky., builders of the Rice sand molding machine. The construction and manner of working of the machine are described at length with the aid of a number of finely executed engravings, and the reader will have no difficulty in gaining a fair general idea of the particular method of machine-molding considered. The catalogue is printed on heavy, highly calendered paper, the matter is well prepared and arranged, and the work throughout reflects credit upon the compilers.

Flour Mill Machinery.

Messrs. E. P. Allis & Co., of the Reliance Works, Milwaukee, Wis., have just issued a large and well-arranged catalogue in which intending purchasers will find everything necessary for a first-class modern mill. It embraces over 250 pages and is very fully illustrated. Special care has been taken to have the tables of dimensions, prices, weights, &c., full and complete, so that millers desiring to purchase may be able to determine whether any machine will fit the intended place. The decriptions are brief, but in many cases they are well supplanted by the engravings, which are often of a detailed character and well executed.

Iron-Working Machinery.

The Lewis Foundry and Machine Company, of Pittsburgh, Pa., have sent out a catalogue in which they refer in an interesting manner to their various forms of iron-working tools. Among these we find corrugating mills, shears for heavy bars, iron sheets and thin plates, roll lathes, vertical double shears, punches and a variety of others. Engravings are given in every instance, and sufficient material is added in the way of description to enable the reader to obtain a very good idea of the character of the machinery.

Shafting, Pulleys, Couplings, &c.

P. Pryibil, of 461 West Fortieth street, the well-known builder of woodwork machinery, has just issued a small catalogue and price list specially devoted to pulleys, wrought iron and steel shafting, couplings, hangers, &c. It embraces 40 pages and is profusely illustrated, enabling the reader to gain a very fair idea of the general character of the devices considered. In addition to the descriptive matter and prices and tables of dimensions, the catalogue furnishes handy information for ordering goods, rules for calculating the driving-power of belts, the speeds and diameters of pulleys, engine horse-powers, &c.

Friction Clutch Pulleys.

In a small catalogue issued a short time ago Messrs. H. N. Bates & Co., of 358 Atlantic avenue, Boston, Mass., illustrate and describe what is known as the Hunter friction clutch pulley and cut-off coupling. Illustrations are given showing the application of clutches in a number of different ways, and a detailed price list is added, giving also the dimensions of pulleys, widths of *faşes* and their bores. A short chapter on the advantages of friction clutches, together with a list of references and a short collection of rules convenient for machinists, constitute the concluding pages of the catalogue.

The Ball Electric-Light System.

A neat little catalogue just issued by the Ball Electric Light Company, of New York, contains an interesting description of the Ball system of electric lighting. The chief novelty in this system is in the dynamo, which is claimed to possess merits peculiar to itself and to be decidedly different from anything hitherto constructed. The dynamo has two armatures, each of which rotates within the inductive influence of only one pole of a field magnet, while other forms of dynamo have one armature radiating within the inductive influence of two poles. The advantages of the dynamo and he Ball arc and incandescent lamps are set forth at some length and a long list of testimonials is given. A partial list of users of the Ball system is also published, showing that the system has already met with considerable favor.

Sight-Feed Lubricators.

The Detroit Lubricator Company, of Detroit, Mich., have just issued a 12-page pamphlet, in which they supply illustrations and a brief description of their sight-feed lubricators. A price list giving the various sizes is also added. Special attention is directed to a recent patent decision by which the lubricating device of Frederick Lunkenheimer has been declared an infringement, and the matter has been referred to a master to take an account of profits and damages. The company announce that the sight-feed features of their lubricators are covered by several letters patent owned by them, and large sums have been expended in successfully establishing their validity in the United States courts.

Fire-Brick.

Messrs. Fredericks, Munro & Co., of Farrandsville, Clinton County, Pa., have just sent out a new illustrated catalogue, covering the different special shapes made by them for blast furnaces, rolling mills, steel works, gas houses, coke ovens, locomotive arches and fireplaces. According to an analysis made in 1878 by J. Blodgett Britton, of Philadelphia, the Farrandsville fire-clay has the following composition:

	Per cent.
Silica	45.26
Alumina	37.85
Sesquioxide of iron	2 03
Lime	0.08
Magnesia	0.02
Potash	1.26
Water and organic matter	13 30
Oxide of manganese and loss	0.20
Total	100.00

Messrs. Fredericks, Munro & Co., who have a capacity of 5,000,000 fire-brick annually, brand their standard shapes Acme, Eureka and Clinton, the first being specially designed for crucible, open-hearth and other steel works and malleable-iron works. The Eureka they recommend for rolling-mill and blast-furnace hearths and boshes, while Clinton is a bar brick for furnace and cupola linings and boiler arches. The catalogue shows the leading standard sizes, and many odd and special shapes.

Evolution of Factory Building.

In his address at Saratoga before the Paper Manufacturers' Association, Mr. Edward Atkinson thus described what he termed the "Evolution of the Modern Factory":

When the factory system was first established the building was of necessity placed in a narrow valley near the water-power by which the machinery was to be operated. It therefore took the form of a narrow building, usually several stories in hight. At that time no material had been invented which would keep out the water from a flat roof; consequently the roof was made like that of the old-style of gambrel-roofed houses, with such variations as the conditions of location and factory called for. The original factories were of much better construction than those which came next. The timbers were placed wide apart; the roof was heavily framed; it was covered with good, tight boards, and in many cases it was protected on the outside with shingles laid over mortar—the very best covering for a pitched roof. Presently the construction of houses changed. The materials began to be cut up into plank, joist and thin boards. Soon the old fashioned timber construction was given up, both in houses and in factories. The factory continued to be built many stories in hight, with floors laid over joists set edgewise, 12 to 18 inches on centers, customarily plastered or sheathed underneath, so as to make a hollow floor, or, when not plastered or sheathed, exposing as many sawed corners as possible to a fire, and as many little narrow interspaces between the joists as might happen, into which narrow spaces it is extremely difficult to send a stream of water. Over this was placed the customary pitched roof, made of rafters of the same kind as the floor joists—namely, thin 1½ or 2 inch plank—placed close together, and covered first with thin boards and then with slate. Inside were commonly to be found vertical sheathing, cutting off the eaves, and perhaps overhead sheathing, leaving a little, narrow, dirty cock-loft in the peak of the roof and a dangerous concealed space at the eaves. Into these concealed spaces rats and mice would carry oily waste, liable to spontaneous combustion, and thus burn off the roofs or destroy the mill. The same thing is constantly occurring in the manufacturing departments of city buildings of which the floors and walls are hollow. A worse invention of the devil for any conceivable purpose connected with the roofing of a building could not at first have been imagined. It was only excelled when what is called the "French roof," with a long line of wooden dormer windows, succeeded this pitched roof, or "barn roof," as we call it. When to this is added a wooden cornice you have the model of everything that can be invented of the worst kind. It was this kind of a lumber yard, surmounting brick and stone vertical walls, which caused the great destruction of Boston. In this pitched roof we have none of the conditions for which a roof is required, except that it will shed water. It does not keep the heat of summer out; it does not keep the warmth of winter in. Sparks will pass through the slates and set the wood on fire; and, when the heat becomes great enough, the slates will crack to pieces and cut the firemen's heads open. When the necessity for placing factories and workshops in the narrowest valleys, where there was not room enough to spread out, measurably ceased through the introduction of steam-power, factories and workshops began to build away from the rivers—on broad plains and in open spaces—where common sense might have been applied to their construction. But man derives many of his faculties from his great grandfather—the monkey—especially the faculty of imitation. It apparently never occurred to the ordinary builder of a factory or a workshop, until lately, that it was not necessary to build a mill four, five or six stories high in the middle of a plain, because such had been the necessity of the narrow valley; hence the builders, especially of shoe factories and of many other kinds of workshops, ran up their high, narrow buildings, badly lighted, badly ventilated, and covered with the worst kind of roofs, all over the country—food for fire, which fools have furnished. By and by men of practical common sense and great ability, like Mr. James B. Francis, of Lowell, and other mill engineers, took hold of the question of factory construction, substituting heavy timbers, set 8 or 10 feet apart, for the joisted floors, plank floors and other methods of improved construction. It remained, however, for the Mutual Underwriters to reach the simple invention of the true factory roof, which is a solid deck, with a pitch of about ½ inch to the foot, laid over heavy timbers, 8 to 10 feet, on centers, both timbers and roof projecting outside the wall, without any wooden cornice or fire trap of any kind.

The Great Eastern has certainly had a very curious history, but perhaps no feature in it is more remarkable than the recent success of the ship as an exhibition and entertainment. It was, as is generally known, intended that the ship should be converted into a coaling station, with every modern appliance for rapid receipt and delivery of coal; but the success of the ship as an exhibition and place of varied entertainment has resulted in the formation of a company for the purchase and working of the ship for this purpose, and subscription is now invited for the company's shares. The success of the enterprise at Liverpool, where the ship has been under charter to an English firm, has directed attention to the various advantages which attach to the easy movement of what would no doubt become ever a favorite entertainment haunt.

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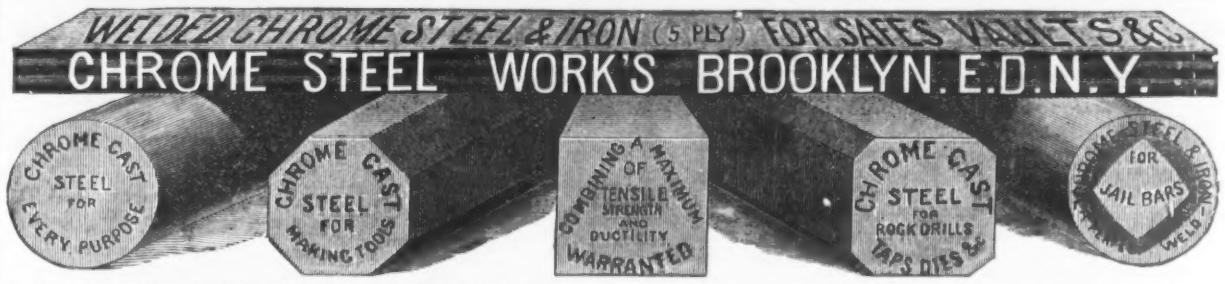

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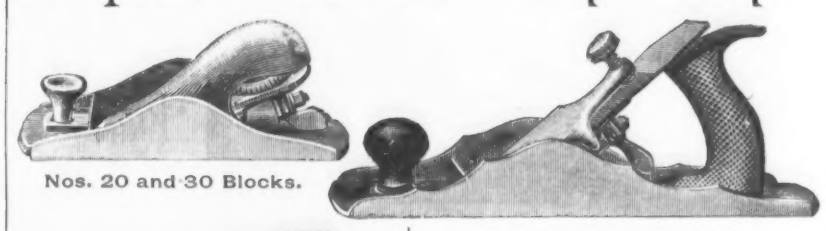

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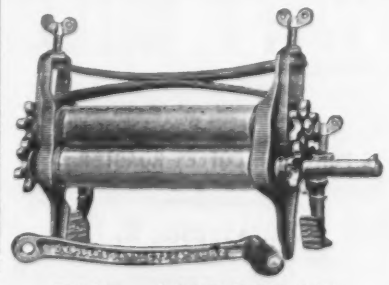

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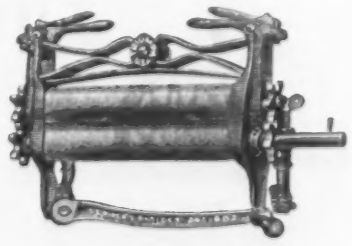

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Snell's Augers and Bits .... dis. 60@60&5 %
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Jennings' Auger Bits, new list, Jan. 1, 1884. dis. 25 %
Cook's Auger Bits and Augers .... dis 55 %
Snell's Ship Augers .... dis 15 @ 20 %
Watrous' Ship Augers .... dis. 15 @ 20 %
Bonney's Pat. Hol. Augers, list $48 ⅌ doz dis .... 40&10 %
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Balances.
Light and Common .... dis. 50 %

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Bevin Bros. Mfg. Co. Light Hand Bells dis. 75@75&10 %
Light Hand Bells .... dis 75&10@75&10&5 %
Swiss Pattern Hand Bells .... 60 %
Connell's Door Bells .... dis. 20&10 %
Gt. Western & Kentucky Cow, new list .... dis. 70 %

Boring Machines
Upright, without Augers .... List, $5.50 } .... dis. 50 %
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Bolts.—Eastern Carriage Bolts, new list, June 10, 1884 .... dis 75&10@75&10&5 %
Phila. Carriage Bolts new list .. dis 75&10@75&10&5 %
Stanley, Wrought Shutter .... dis. 60&10 %

Braces.—Barber's Improved .... dis 50 %
Barber's Old Style .... 50&10 %
Backus, Polished .... dis 60&10@60&10&5 %
Backus, Nickeled .... dis. 60@60&10 %
Spofford .... dis 50&5@50&10 %
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Butts.
Cast Fast Joint, Narrow .... dis 60 %
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Cast Acorn, Loose Pin } dis 70 @ 70&10 %
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Wrought Table Hinges and Back Flaps .... dis 65 %
Wrought Loose Joint .... dis. 65&5 %
Wrought Narrow Fast .... dis. 65 %

Blind Butts.
Parker .... dis. 75&2 %
Clark .... dis. 80 @ 80&5 %
Shepard .... dis. 75&10&5 @ 80 %
Lull & Porter .... dis. 80&10 %
Huffer's .... dis. 50 %

Casters.—Bed (new list July 1, 1880) Plate .... dis 60 @ 60&5 %

Chains.—German Halter and Coil, list June, 1884 .... dis. 55 @ 55&5 %
Galvanized Pump .... ⅌ lb 5¼@6¢
Best Proof Coil Chain—English.

⅌ lb	9¼	6¾	5¾	5½	5	4¾
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Butcher's .... $5 00@$5.25 to £ gold

Coffee Mills.—Box and Side (new list Jan. 1. 1880 .... dis 45&10 %
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American Parlor Door Hanger ... $8.00; dis 20&10 %

Drawing Knives.
Hart Mfg. Co.'s .... dis. 75@75&5 %
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Nicholson .... dis 60 %
Disston .... dis 60&10 %
Butcher ....
Crown and Arrow .... 60&10&5 %

Fluting Machines.
Eagle—3½ in. roll .... each, $2.15 } dis 35 %
Eagle—5½ in. roll .... each, 2.85 }
Crown—4½ in. roll .... each, 3.50 }
Crown—6 in. roll .... each, 4.00 } dis 35 %
Crown—8 in. roll .... each, 6.50 }
Geneva Fluter .... dis 25 %
Favorite com. Fluter and Sad Iron .. ⅌ doz., $10.50 net

Fry Pans.
Burnished .... dis 70 %

⅌ doz	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00
No.	0	1	2	3	4	5	6		8

Hammers.
Yerkes & Plumb's, new list .... dis 40&5 %
Maydole Hammers, new list .... dis 25@25&10 %
Howell A. E. Nail Hammers .... ⅌ doz., net $3.75

Handles.
Disston Loop Handles Cross-Cut .... 20¢ pair net
Boynton Loop Handles Cross-Cut .... 20¢ pair net

Hatchets.
Yerkes & Plumb, new list .... dis 40&5 %
Hunt .... dis 40 @ 40&5 %

Hay and Straw Knives.
Lightning .... ⅌ doz., $18.00 dis. 20 %
Electric .... ⅌ doz., $9.50 @ 10.50
Wadsworth .... ⅌ doz., net d's 35&5@40 %
Walton Straw Knives .... ⅌ doz., net 17.00
Gem Hay Knife .... ⅌ doz $12.50@13.50

Hinges.
Strap and T .... dis 65&5 %

Horse Nails.

Nos.	5	6	7	8	9	10	
Globe	26	23	21	20	19	18	dis 10&5&5 %
Ausable	30	27	25	24	23	23	dis 25&10 %
" Pol'ed and P't'd & Blued & P't'd	31	28	26	25	24	23	dis 25&10 %
Clinton		23	21	20	19	18	dis 25&10 %
" Pol'ed & P't'd.		24	22	21	20	19	dis 25&10 %
Saranac	26	23	21	20	19	18	dis 25@30 %

Locks and Knobs.
Branford Locks .... dis 45&2 %
Parker's Cabinet .... dis 40&2 %
American Padlocks .... dis 70&5 @ 70&10&5 %
Scandinavian Padlocks .... dis 50 %

⅌ doz ..	$5.00	5.50	6.50	7.50	8.50	10.00	12.50	dis 60 %
No.	57	58	59	60	61	62	63	
⅌ doz		$18.00		26.00		33.00		dis 60 %
No.		64		65		66		

Lanterns.
Buckeye .... large list, net; small list, net
Tubular, No. 0, $6.75@7.00; No. 1, $8.25@8.50 ⅌ doz. net
Guards 40¢ extra.

Lawn Mowers.—Pennsylvania }
Philadelphia }
Excelsior } dis 50 %
Continental }
Quaker City }

Lawn and Garden Pumps.
Holland Patent .... list, $5.00, dis 10 %

Mattocks.
Long and Short Cutter .... new list, 60&10 %
Pennsylvania Pattern .... dis 60& 10 %

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets. dis. 20&10 %
Stebbins' Gates .... dis. 70&10 %
Lincoln's Gates .... dis. 60⅔&10 %
Landers, Frary & Clark's Petroleum .... dis 40&10 %
Brass Liquor Cocks new list Jan. 1, 1880. dis. 55&10 %
Cork Lined Cocks .... dis. 70 %

Meat Cutters.
Dixon's .... dis. 45@5 %
Woodruff .... dis. 45@5 %
Stowe .... dis. 45@5 %
Hale's .... dis. 70@70&5 %
American .... dis 35 %
Stuffers .... dis. 40 %
Enterprise Stuffers .... dis. 30 %

Parers, Apple and Peach.
Ideal Apple Parers .... per doz $5.00
Waverly Apple Parers .... per doz $4.50
Goodell White Mountain Apple Parers per doz $5.00
Goodell Lightning Apple Parers .... per doz $6.00
Monarch Peach Parers .... per doz $15.00 dis 10 %

Planes.—Sandusky Tool Co. .... dis. 20&2 %
Ogontz .... dis. 25&2 %
Ohio and Auburn .... dis. 20&2 %
Bailey (S. R. & L. Co.) .... dis. 20&10 %

Plane Irons.—Ohio Tool Co. .... dis. 20&10 %
Butcher's .... $5.00 @ 5.25 to £

Plumbs and Levels.
Stanley's Adjustable .... dis. 70&10 %
Stanley's Non-Adjustable .... dis. 70&10 %

Picks.—New list .... 60 %

Razor Strops.
Lamont Combination .... ⅌ doz. $4.00
Lamont Combination .... 1 gross lots $42.00
Imitation Emerson .... ⅌ doz. $2.00, 20&10&10 %

Rules.—Stanley Boxwood .... dis. 80&5@80&10 %
Stanley Ivory .... dis. 55 @55&10 %

Steelyards.—Hart's Pattern .... dis40&10@50&5 %

Per doz	$14.50	17.75	21.00	26.50	31.00	35.50
Lbs	50	100	150	200	250	300.

American Pattern .... dis. 40&10@50 %

Per doz	$8.00	10.25	13.75	15.60	16.75	19.50
Lbs	50	100	150	200	250	300

Scale Beams .... 60&5@60&10 %
Custers .... 25 %

Squares.
Steel and Iron. dis. 60&10 %; full cases dis .... 70&10@70&10&5 %
Try Squares, Stanley .... dis 60&10 %
Disston's Try Squares .... dis 45&10 %

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened .... ⅌ doz $7.00 net
Clipper No. 10, Bronzed Blade, Boxed and Sharpened .... ⅌ doz $6.70 net

Saws.—Disston's Hand, Panel and Rip .... dis 20&10 %
Disston's Circular .... dis 45&10 %
Cross-Cut No. 2, Plain Tooth .... dis 45&10 %
Cross-Cut Patent Tooth .... dis 45&10 %
Cross-Cut Champion Tooth .... dis 45&10 %

Shovels and Spades.
Oliver Ames & Sons, new list .... dis 20 %
Griffiths .... dis 50&10@60 %
Rowland .... dis 60@60&5 %

Sad Irons.—4 to 10 lb .... ⅌ lb 2.35@2.50¢
Mrs. Potts' Patent .... dis 35@40 %

Stone.
Washita Extra .... ⅌ lb 30¢
Washita No. 1 .... ⅌ lb 25¢
Washita No. 2 .... ⅌ lb 20¢
Washita Slips .... ⅌ lb 50¢
Washita Axe .... ⅌ lb 15¢
Hindostan Oil Stone No. 1 .... ⅌ lb 4½ %
Hindostan Axe Stone .... ⅌ lb 5¢
Hindostan Slips .... ⅌ lb 8¢

Screws.—Parker list (new list).
Flat Head Iron .... dis 75&10 %
Flat Head Brass .... dis 75 %
Round Head Brass .... dis 70 %
Round Head Iron .... dis 70&10 %

Spoons.
Plated .... dis 50&10@60 %
German Silver .... dis 50 @ 50&5 %
Britannia, Boardman's .... dis 60 %
Britannia, Parker's .... dis 60&10 %
Tinned .... dis 10 %

Springs.—Torrey .... dis 50 %
Gem No. 3 small Japanned .... $2.00 } dis 50&10 %
Gem No. 2 medium Japanned .... 2.75 }
Coil No. 10 ⅌ gross net .... $5.50@6.00
Other Standard Springs .... dis 50&10@60 %
Warner Door Springs, ⅌ doz. $2.50 .. dis 40&10 @ 50 %
Standard Spring Hinges—
Single No. 0, ⅌ doz. net .... $1.10@1.25
Single No. 1, ⅌ doz. net .... 1.25@1.50
Other Standard Spring Hinges .... dis 25&10@40 %

Stocks and Dies. .... dis 30 @ 30&10 %

Stove Polish.—Gem .... ⅌ gross, $4.50, dis 10 %
Dixon .... 6.00, dis 10 %
Fire Fly .... $3.00 gross, net

Tacks. .... Combination discounts
Shoe Nails—4-8, and over, 5½¢ .... } 10 %
Shoe Nails—3½-8, and under 7¢ .... }
Double Pointed Tacks .... dis 80 %

Traps.
Genuine Oneida—Newhouse .... dis 35 %
Im. Oneida—Newhouse list. First qual. dis 60&10&10 %

Vises.—Solid Box. Trenton new list .. dis 50&10@60 %

Wrenches.—Agricultural .... dis 80@80&5 %
Coes' Genuine .... dis 60&3 %
Coes' Mechanics' .... dis 60&10&3 %
Coes' Mechanics,' Mall. Bar .... dis 80 @ 80&5 %

Wire.
Bright or Annealed, No. 0 to 18 .... dis 65&5 %
Bright or Annealed, No. 19 to 26 .... dis 70 %
Bright or Annealed, No. 27 to 36 .... dis 70 %
Coppered, 0 to 18 .... dis 65 %
Tinned Broom Wire .... dis 65 %
Galvanized Barb Wire .... 5¢
Painted Barb Wire .... 4½¢
Galvanized, Nos. 7 to 18 ... Market List, dis .... 60 %

Wringers. Per doz.
Peerless No. 2½ 27.00
Peerless No. 3½ 31.50
Universal, No. 2½ 27.00
Universal, No. 2 .... 30.00
Universal, No. 1½ 31.50
Universal, No. 1⅛ 36.00
Universal, No. 1 .... 54.00
Universal, for Set Tubs, A 2½ 36.00
Universal, for Set Tubs, E 1½ 45.00
Universal, for Set Tubs, C 1 .... 63.00
Novelty, for Common Tubs, No. 2 & 2½, 10 in 27.00
Novelty, for Common Tubs, No. 3 & 3½, 11-in 31.50
Excelsior, for Stationary Tubs, No. E, 10-inch 36.00
Excelsior, for Stationary Tubs, No F, 11-inch 40.50
Excelsior, with Folding Bench, No. A, 10-inch 45.00
Excelsior, with Folding Bench, No. B, 11-inch 49.50
(net, dis2 % cash in 10 days.)

PITTSBURGH.

Merchant Iron.

TERMS.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 ⅌ cent. for cash if remitted within 10 days from date of invoice.

For fluctuations and discounts on card rates see weekly Pittsburgh Trade Report.

The following are card rates.

Flat Bar.
1½ to 4 by ⅜ to 1 .... 2.0¢ | 1¼ and 1⅜ by ⅜ to ¾. 2.1¢
4½ to 6 by ⅜ to 1 .... 2.1¢ | 1 and 1⅛ by ⅜ to ¾ .... 2.2¢
1⅜ to 6 by 1⅛ to 1½ .... 2.4¢ | ⅝, ¾ and ⅞ by ⅜ to ⅝. 2.4¢

Rounds and Squares.

1 to 1⅞ .... 2.0¢	4½ to 5 .... 3.5¢	⅜ .... 2.6¢
2 to 2⅝ .... 2.2¢	¾ to ⅞ .... 2.1¢	5-16 .... 2.8¢
2¾ to 3¼ .... 2.5¢	⅝ to 9-16 .... 2.2¢	¼ .... 3.0¢
3⅜ to 4 .... 3.0¢	½ to 7-16 .... 2.4¢	3-16 .... 5.0¢

Oval Iron.
¾ to 1½ .... 2.4¢ | ½ .... 2.8¢
⅝ to ⅝ .... 2.6¢ | ⅜ .... 3.2¢

Half Oval and Half Round.
¾ to 1¼ inch .... 2.7¢ | ½ inch .... 3.5¢
⅝ to ⅝ " .... 3.2¢ | ⅜ " .... 5.0¢

Horse Shoe.
⅝ to 1⅛ by 5-16 to ⅝ inch .... 3.0¢

Wagon Box Iron.
¾ inch, Nos. 13 & 14 .. 3.2¢ | ⅝ inch, Nos. 11 & 12 .. 3.3¢
⅞ " " 11 & 12 .. 3.0¢ | ⅝ " " 13 & 14 .. 3.9¢
¾ " " 13 & 14 .. 3.5¢ | ⅝ " " 11 & 12 .. 3.6¢

Heavy Bands.
3½ to 6 by ¼ & 5-16 .. 2.2¢ | ¾ to ⅞ by ¼ & 5-16 .. 2.5¢
1½ to 3¼ by ¼ & 5-16 .. 2.2¢ | ⅝ & ½ by ¼ & 5 16 .... 3.0¢
1 to 1⅜ by ¼ & 5-16 .. 2.3¢

Light Bands.
1½ to 6 by ⅛ to 3-16 .... 2.5¢ | ¾ & 11-16 by ⅛ to 3-16. 3.2¢
1½ to 6 by Nos. 11 & 12. 2.6¢ | ¾ & 11-16 by Nos. 11, 12. 3.3¢
1 to 1⅜ by ⅛ to 3-16 .... 2.6¢ | ⅝ & 9-16 by ⅛ to 3-16 .. 3.5¢
1 to 1⅜ by Nos. 11 & 12. 2.7¢ | ⅝ & 9-16 by Nos. 11, 12. 3.6¢
⅞ & 13-16 by ⅛ to 3-16. 2.9¢ | ½ inch by ⅛ & 3-16 .... 3.8¢
⅞ & 13-16 by Nos. 11, 12. 3.0¢ | ½ in. by Nos. 11 & 12 .. 3.9¢

Hoop Iron.

1¼ to 4, Nos. 13, 14, 15. 2.8¢	¾, Nos. 19 and 20 .... 3.7¢
1¼ to 2, Nos. 16, 17, 18. 2.9¢	¾, No. 21 .... 3.8¢
1¼ to 2, No. 19 .... 3.0¢	¾, No. 22 .... 3.9¢
1¼ to 2, No. 20 .... 3.1¢	11-16, Nos. 13, 14 & 15. 3.7¢
1¼ to 2, No. 21 .... 3.2¢	11-16, Nos. 16, 17 & 18. 3.8¢
1¼ to 2, No. 22 .... 3.3¢	11-16, Nos. 19 and 20. 3.9¢
15-16, 1 & 1⅛, Nos. 13, 14 & 15 .... 3.0¢	11-16, No. 21 .... 4.0¢
	11-16, No. 22 .... 4.1¢
15-16, 1 & 1⅛, Nos. 16, 17 & 18 .... 3.1¢	⅝, Nos. 13, 14 and 15. 3.9¢
	⅝, Nos. 16, 17 and 18. 4.0¢
15-16, 1 & 1⅛, Nos. 19 & 20 .... 3.2¢	⅝, Nos. 19 and 20 .... 4.1¢
	⅝, No. 21 .... 4.2¢
15-16, 1 & 1⅛, No. 21 .. 3.3¢	⅝, No. 22 .... 4.3¢
15-16, 1 & 1⅛, No. 22 .. 3.4¢	⅝, No. 23 .... 4.4¢
⅞, Nos. 13, 14 and 15. 3.2¢	9-16, Nos. 13, 14 & 15. 4.1¢
⅞, Nos. 16, 17 and 18. 3.3¢	9-16, Nos. 16, 17 & 18. 4.2¢
⅞, Nos. 19 and 20 .... 3.4¢	9-16, Nos. 19 and 20 .. 4.3¢
⅞, No. 21 .... 3.5¢	9-16, No. 21 .... 4.4¢
⅞, No. 22 .... 3.6¢	9-16, No. 22 .... 4.5¢
13-16, Nos. 13, 14 & 15 .. 3.4¢	9-16, No. 23 .... 4.6¢
13-16, Nos. 16, 17 & 18 .. 3.5¢	½ inch, Nos. 13, 14, 15. 4.3¢
13-16, Nos. 19 and 20 .. 3.6¢	½ inch, Nos. 16, 17, 18. 4.4¢
13-16, No. 21 .... 3.7¢	½ inch, Nos. 19 & 20 .. 4.6¢
13-16, No. 22 .... 3.8¢	½ inch, No. 21 .... 4.7¢
¾, Nos. 13, 14 and 15 .. 3.5¢	½ inch, No. 22 .... 4.8¢
¾, Nos. 16, 17 and 18 .. 3.6¢	½ inch, No. 23 .... 4.9¢

The prices under Hoop do not apply to Cotton Ties. 1-10¢ ⅌ lb extra will be charged for each gauge lighter than the lightest indicated.

1-10¢ ⅌ lb extra will be charged for cutting Hoops to specified lengths.

Barrel Hoops.
1¼ to 2 in., cut to length.
9 to 11 lb, ⅌ set of 6 hoops .... 3.0¢
8 lb and less than 9 lb, ⅌ set of 6 hoops .... 3.1¢
Less than — lb, ⅌ set of 6 hoops .... 3.2¢

Extras for cutting to length all preceding Iron, including Tire 1.10

Tank Iron.
No. 9 & heavier, 2.8¢; Plow Slabs, 3.0¢; Plow Wings, 3.3¢

Sheet Iron.

	Common.	Charcoal.	Juniata.
Nos. 10 to 14	3.0¢	4.5¢	6.0¢
Nos. 15 to 17	3.3¢	4.8¢	6.3¢
Nos. 18 to 21	3.6¢	5.1¢	6.6¢
Nos. 22 to 24	3.8¢	5.3¢	6.8¢
Nos. 25 and 26	4.0¢	5.5¢	7.0¢
No. 27	4.2¢	5.7¢	7.2¢
No. 28	4.6¢	6.1¢	7.6¢

All sheets No. 18 and lighter, over 30 inches wide, not less than 2.10¢ extra.

Wood's Patent Planished Sheet.
1st quality (A) .... 10¢ | 2d quality (B) .... 9¢

American Galvanized Sheets.
(Soho C. H. B.) Brand. Patent Leveled:
Nos. 14 to 20 .... 12¢ | No. 27 .... 15¢
Nos. 21 to 24 .... 13¢ | No. 28 .... 16¢
Nos. 25 and 26 .... 14¢ | No. 29 .... 18¢
60 @ 62½ % discount.

Coal Screen Iron.
1⅜ by ⅝ by 5-16 .... 2.5¢ | 1 by ⅝ by 5-16 .... 3.0¢

Angle Iron.
2½, 3, 3½ and 4 inch .. 2.8¢ | 1½ by 1, for Pl. Hand .. 3.3¢
1½, 1¾, 2 and 2¼ " .. 2.8¢ | 1½ by ¾ " " .. 3.3¢
1¼ inch .... 2.9¢ | 1⅜ by ¾ " " .. 3.4¢
1 " .... 3.1¢

T Rail.
8 lb to the yard .... 2.4¢ | 20 lb to the yard .... 2.3¢
12 " " .... 2.3¢ | 28 " " .... 2 3¢
16 " " .... 2.3¢ | 30 " " .... 2.3¢

Splice Joints for 12, 16 and 20 lb Rail, 30¢ each; 28 and 30 lb Rail, 40¢ each: 40 lb, 50¢ each.
3½ by ⅝ and ½ Spikes for 20 and 28 lb Rail .... 3¼¢
2½ and 3 by ⅜ " " 12 and 16 lb " .... 3.5¢
2½ by 5-16 " " 8 lb Rail .... 4.0¢

Flat Rails.—Punched and Countersunk.
1¼ to 2 by ½ to ⅝ inch .... 2.5¢
1⅜ by ⅜ and 7-16 inch .... 2.7¢
1¼ by ⅜, 7-16 and ½ inch .... 3.0¢

Juniata Nail Rods, 6.0¢; Norway Nail Rods, 7.5¢.
Guard Iron, ¼x¾x⅜ and ⅛x¾x⅜ .... 3.5¢
Guard Iron ¾x⅜x9-16 and ⅛x⅝x¼ .... 3.7¢
Drag Bars .... 2.8¢ | Cyl. & Landside Iron .. 2.7¢
Dropper Bars .... 3.3¢ | Plow Beam Iron .... 2.5¢

Nails.

See Pittsburgh Trade Report.

Tool Steel.

Classification Adopted April 13, 1886, Steel Association of United States.

ROUND, SQUARE AND OCTAGON.

⅝ to 2 ... base, 8.0¢	6½ to 7 .... 3.0¢	¼ & 9-32. 3.0¢
2½ to 3 ... ext. 1.0¢	7½ to 8 .... 3.5¢	3-16 .... 5.0¢
3½ to 4 .... 1.5¢	9-16 to ½ .... 0.5¢	5-32 .... 10.0¢
4½ to 5 .... 2.0¢	7-16 to ⅜ .... 1.0¢	⅛ .... 18.0¢
5½ to 6 .... 2.5¢	5-16 and 11-32 2.0¢	

FLATS.
2 to 9-16 inches wide x 2 to ⅝ inches thick ... base, 3.0¢

List of Extras.

8 x 7 .... 3.5¢	6 x ⅜ .... 1.0¢	⅝ x 7-16 .... 1.0¢
8 x 6 .... 2.5¢	6 x ¼ .... 1.0¢	⅝ x ⅜ .... 1.0¢
8 x 5 .... 2.5¢	6 x ⅛ .... 2.0¢	⅝ x 5-16 .... 1.5¢
8 x 4 .... 2.0¢	5 x 4 .... 1.5¢	⅝ x ¼ .... 1.5¢
8 x 3 .... 1.5¢	5 x 3 .... 1.0¢	⅝ x 3-16 .... 2.0¢
8 x 2 .... 1.5¢	5 x 2 to ⅝ .. 1.0¢	⅝ x ⅛ .... 2.0¢
8 x 1¾ to ⅝ 1.0¢	5 x ½ .... 1.0¢	½ x 7-16 .... 1.0¢
8 x ½ .... 1.0¢	5 x ¼ .... 1.0¢	½ x ⅜ .... 1.0¢
8 x ¼ .... 2.0¢	5 x ⅛ .... 2.0¢	½ x 5-16 .... 1.5¢
8 x ⅛ .... 3.0¢	4 x 3 .... 1.0¢	½ x ¼ .... 1.5¢
7 x 6 .... 2.5¢	4 x 2 to ⅝ .. 1.0¢	½ x 3-16 .... 2.0¢
7 x 5 .... 2.0¢	4 x ½ .... 1.0¢	½ x ⅛ .... 3.0¢
7 x 4 .... 2.0¢	4 x ¼ .... 1.0¢	⅜ x 5-16 .... 1.5¢
7 x 3 .... 1.5¢	4 x ⅛ .... 2.0¢	⅜ x ¼ .... 2.0¢
7 x 2 to ⅝ .. 1.0¢	3 x 3 to ⅝ .. 1.0¢	⅜ x 3-16 .... 3.0¢
7 x ½ .... 1.0¢	3 x ½ .... 1.0¢	⅜ x ⅛ .... 4.0¢
7 x ¼ .... 1.0¢	3 x ¼ .... 1.0¢	5-16 x ¼ .... 2.0¢
7 x ⅛ .... 2.0¢	3 x ⅛ .... 2.0¢	5-16 x 3-16 .... 4.0¢
6 x 5 .... 2.0¢	2 to ⅝ x ½. 1.0¢	5-16 x ⅛ .... 8.0¢
6 x 4 .... 1.5¢	2 to ⅝ x ¼. 1.5¢	¼ x 3-16 .... 5.0¢
6 x 3 .... 1.5¢	2 to ⅝ x ⅛. 2.0¢	¼ x ⅛ .... 15.0¢
6 x 2 to ⅝ .. 1.0¢	⅝ x ½ .... 1.0¢	3-16 x ⅛ .... 20.0¢

All unenumerated sizes will be charged at price of next larger dimension in list. Cutting to multiples or specified lengths, ½¢ ⅌ lb for over 24-inch; under, according to contract.

Crucible Steels.

CRUCIBLE MACHINERY, ROUNDS AND SQUARES.
¾ to 3 inches .... base, 4.0¢ | ⅜ to 7-16 in .... extra, 0.5¢
3½ to 4 in .... extra, 0.5¢ | 5-16 and 11-32 in .. ex., 1.0¢
4½ to 5 in .... extra, 1.0¢ | ¼ and 9-32 .... extra, 1.5¢
5½ to 6 in .... extra, 1.5¢ | 3-16 inch .... extra, 3 0¢
½ to 11-16 in ... extra, 0.2¢

Octagons, ½¢ extra throughout the list. Flats, one-half the extras of the Flat Tool Steel classification. Cutting to multiples or specified lengths, 1½¢ per pound for anything over 24 inches long. For lengths 24 inches or less, according to to special contract.

CRUCIBLE SPRING STEEL, FLAT.
1¼ to 4 in. x No 4 gauge to ½ in. inc .... base, 4.0¢
1 and 1⅛ in. x No. 1 gauge to 4 gauge inc ... extra, 0.2¢
1 to 3 in. x No. 5 gauge to 7 gauge inc .... extra, 0.5¢
⅞ to 3 in. x No. 8 gauge to 10 gauge inc .... extra, 1.0¢
¾ to 3 in. x No. 11 gauge to 16 gauge inc .... extra, 2.0¢
¾ to 3 in. x No. 17 gauge to 20 gauge inc .... extra, 3.5¢
⅝ to ⅝ in. x No. 10 gauge to 16 gauge inc ... extra, 4.0¢
⅝ to ⅝ in. x No. 17 gauge to 20 gauge inc ... extra, 5.0¢
⅝ to ⅝ in. x No. 21 gauge to 24 gauge inc ... extra, 6.0¢
Cut to length, 24 inches and over, ¼¢ per pound extra and under, according to special contract.

ROUND AND SQUARE CRUCIBLE SPRING STEEL.
⅝ to 1½ inches .. base, 4.0¢ | 5-16 in .... extra, 1.0¢
½ to 9-16 in .... extra, 0.2¢ | ¼ in .... extra, 1.5¢
⅜ to 7-16 in .... extra, 0.5¢

CRUCIBLE SHEET STEEL, ALL GRADES.
To 21 gauge (for best quality), base, 9.0¢; 22 gauge, extra, 1.0¢; and 1¢ advance of extra for every No. of gauge to No. 26.

CRUCIBLE CIRCULARS.

Diameter.		Diameter.	
To 46 inch	base, 11¢	56 to 60 inch ..	extra, 5¢
48 inch	extra, 1¢	62 to 64 inch ..	extra, 7¢
50 inch	extra, 2¢	66 to 70 inch ..	extra, 9¢
52 to 54 inch ..	extra, 3¢	72 inch	extra, 11¢

Bessemer and Open-Hearth Steels.

MACHINERY ROUNDS AND SQUARES.
¾ to 3 in. inc .... base, 2.8¢ | ½ to 11-16 inch inc .... 0.2¢
Extra. | ⅜ to 7-16 inch inc .... 0.3¢
3½ to 4 inches inc .... 0.3¢ | 5 16 and 11-32 in. inc .. 0.5¢
4½ to 5 inches inc .... 0.5¢ | ¼ and 9-32 inch inc .... 0.7¢
5½ to 6 inches inc .... 1.0¢
Machine cutting to specified lengths above 24 in .. 0.2¢
Machine cutting to specified lengths, 12 to 24 in .. 0.4¢
Machine cutting to specified lengths, less than 12 in., according to contract, but not less than 0.6¢ extra on each size. Shearing or sawing, one-half of the above extras for cutting.

MACHINERY FLATS.
1¼ in. and wider x ⅜ to 1 in. thick .... base, 2.8¢
1¼ in. and wider x ¼ to 5-16 in. thick .... extra, 0.1¢
1¼ in. and wider x 3-16 and 7-32 in. thick ... extra, 0.2¢
1¼ in. and wider x ⅛ and 5-32 in. thick .... extra, 0.3¢
¾ in. to 1⅛ in. x ¼ to 1 in. thick .... extra, 0.2¢
¾ in. to 1⅛ in. x 3-16 and 7-32 in. thick .... extra, 0.3¢
¾ in. to 1⅛ in. x ⅛ and 5-32 in. thick .... extra, 0.5¢
⅜ in. to ⅝ in. x ¼ to ½ in. thick .... extra, 0.3¢
⅜ in. to ⅝ in. x 3-16 and 7.32 in. thick .... extra, 0.5¢
⅜ in. to ⅝ in. x ⅛ and 5-32 in. thick .... extra, 0.7¢
⅜ in. to 1⅛ in. x 1-16 and 3-32 in. thick .... extra, 2.0¢
1¼ in. to 3 in. x 1-16 and 3-32 in. thick .... extra, 1.0¢

TIRE STEEL, ROUND EDGES.
¾ inch and wider x ⅜ to 1 inch thick .... base, 2.6¢
Extras same as Flat Machinery extras.

TIRE STEEL, SQUARE EDGES.
Throughout the list 0.2¢ more than for same sizes of Round Edge Tire.

TOE-CALK STEEL.
1¼ inches and wider x ⅜ to 1 inch thick .... base 2.7¢
Extras same as Machinery Extras.

SLEIGH-SHOE STEEL.
1¼ inches and wider x ⅜ to 1 inch thick .... base, 2.8¢
Extras same as Machinery Extras.

SPRING STEEL FLAT.
1¼ to 4 in. x No. 4 gauge to ½ in. inc .... base, 2.9¢
1 and 1⅛ in. x No. 1 gauge to 4 gauge inc ... extra, 0.2¢
1 to 3 in. x No. 5 gauge to 7 gauge inc .... extra, 0.5¢
⅞ to 3 in. x No. 8 gauge to 10 gauge inc .... extra, 1.0¢
¾ to 3 in. x No. 11 gauge to 16 gauge inc .... extra, 2.0¢
¾ to 3 in. x No. 17 gauge to 20 gauge inc .... extra, 3.5¢
⅝ to ⅝ in. x No. 10 gauge to 16 gauge inc .... extra, 4.0¢
⅝ to ⅝ in. x No. 17 gauge to 20 gauge inc .... extra, 5.0¢
⅝ to ⅝ in. x No. 21 gauge to 24 gauge inc .... extra, 6.0¢
Bessemer and Open-Hearth cut to length, 24 inches and over, 0.1¢ per pound extra; and under, by special contract.

ROUND SPRING STEEL.
⅝ to 1½ inches .. base, 2.9¢ | 5-16 inch .... extra, 1.0¢
½ to 9-16 in .... extra, 0.2¢ | ¼ inch .... extra, 1.5¢
⅜ to 7-16 in .... extra, 0.5¢

CUTLERY STEEL.
14 gauge thick and heavier .... base, 3¢
15, 16 and 17 gauge .... extra, 1¢
18 and 19 gauge .... extra, 2¢
Rounds, ¾ diameter and heavier .... base, —¢
Rounds, smaller sizes, extras same as Machinery.
Double bevel, 14 gauge and heavier .... —¢
Double bevel, thinner than 14 gauge .... extra, 1¢
Fork Steel, Open-Hearth or Bessemer .... 3¢
Rake Steel, Open-Hearth or Bessemer .... 4¢
Hoe Steel, Open-Hearth or Bessemer .... 3¢
Auger Bit Steel, Open-Hearth or Bessemer .... 3¢
Plow Slabs, Open-Hearth or Bessemer .... 3¢
Ovals and Half Ovals, Half Rounds and Special Shapes subject to special agreement.
No freight allowance shall be made on less than 500 pounds of Steel in one shipment.

MISCELLANEOUS.
Axle Billets .... 2 ¢ | Thrasher Steel .... 2½¢
Scythe Back Steel .... 3 ¢ | Thrasher Teeth .... 3½¢
Grain Drill Bars .... 2½¢ | Rolled Ham'r Billets .2½¢
Grain Drill Points .... 3½¢
Cutter Shoe, cut to lengths and tapered .... 3¢
Rolling Coulter Blanks, cut and punched .... 6¢
Terms.—Four months: 3 per cent. discount for cash if remitted within 30 days.

Plate Steel.

Shell Steel, ¼ inch thick and heavier, 50,000 to 60,000 pounds tensile strength .... base, 3.25¢
Shell Steel, 3-16 inch thick, 50,000 to 60,000 pounds tensile strength .... extra, 0.3¢
Shell Steel, 8 gauge and 9 gauge thick, 50,000 to 60,000 pounds tensile strength .... extra, 0.5¢
Shell Steel, 10 gauge to 12 gauge thick, 50,000 to 60,000 pounds tensile strength .... extra, 0.7¢
Shell Steel Plates, 90 inches to 100 inches wide, extra on each thickness, ¼¢
Shell Steel Plates, 100 inches to 105 inches wide, extra on each thickness, ½¢
Shell Steel Heads, 95 inches diameter to 105 inches diameter .... extra on each thickness, ½¢
Shell Steel Heads, 105 inches diameter to 108 inches diameter .... extra on each thickness, 1.0¢
Flange Steel, ¼ inch thick and heavier, 50,000 to 60,000 pounds tensile strength .... extra, 0.5¢
Flange Steel, 3-16 inch thick, 50,000 to 60,000 pounds tensile strength .... extra, 0.8¢
Flange Steel, 8 gauge and 9 gauge thick, 50,000 to 60,000 pounds tensile strength .... extra, 1¢
Flange Steel, 10 gauge to 12 gauge thick, 50,000 to 60,000 pounds tensile strength .... extra, 1.2¢
Flange Steel Plates, 90 inches to 100 inches wide, extra on each thickness, ¼¢
Flange Steel Plates, 100 inches to 105 inches wide, extra on each thickness, ½¢
Flange Steel Heads, 95 inches diameter to 105 inches diameter .... extra on each thickness, ½¢
Flange Steel Heads, 105 inches diameter to 108 inches diameter .... extra on each thickness, 1¢
Best Boiler Steel, ¼ inch thick and heavier, 50,000 to 70,000 pounds tensile strength .... extra, 1¢
Best Boiler Steel, 3-16 inch thick, 50,000 to 70,000 pounds tensile strength .... extra, 1.3¢
Best Boiler Steel, 8 gauge and 9 gauge thick, 50,000 to 70,000 pounds tensile strength .... extra, 1.5¢
Best Boiler Steel, 10 gauge to 12 gauge thick, 50,000 to 70,000 pounds tensile strength .... extra, 1.7¢
Best Boiler Steel Plates, 90 inches to 100 inches wide, extra on each thickness, ¼¢
Best Boiler Steel Plates, 100 inches to 105 inches wide .... extra on each thickness, ½¢
Best Boiler Steel Heads, 95 inches diameter to 105 inches diameter .... extra on each thickness, ½
Best Boiler Steel Heads, 105 inches diameter to 108 inches diameter .... extra on each thickness, 1¢

Heads, when not in complete Boiler sets, to be ⅝¢ per pound extra on each above grade, thickness and size. No Steel to be sold as Marine Boiler Steel except Best Boiler grade. Tank Steel, not stamped, ½¢ per pound less than Shell Steel, subject to same classification.

Miscellaneous Cast Steel.

Auger and Auger Bit .... 3¢ | Roller .... 5½¢
Axle Steel for carriages and wagons .... 3¢ | Spindle, subject to Machin'y classification. 5½¢
Frog Points & Plates. 5½¢ | Trap Spring Steel .... 6¢
Frog Side Bars .... 5¢ | Forged Crank Pins and Lathe Spindles .... 7½¢
Pick, plain (hammered). 5¢ | Piston Rods, plain .... 4¢
Pick and Mattock, beveled (rolled) .... 3¢ | Piston Rods, forged to shapes .... 7½¢
Skate Steel .... 4½¢ | Slide Bars, plain .... 5¢
Pike and Cant Hook .... 7¢ | Do., forged to shapes ... 7½
Coal & Granite Wedge .. 7¢

FILE CAST STEEL.
Square, Round, Half Rnd and Flat Bastard, 8 in. and over .... | Mill Saw, 8-in. and over. 5¢
| Taper, 3½-in. and over .. 6¢
| Horse and Shoe Rasp .... 5¢

SPRING CAST STEEL.
Spiral, Taper, cut to lengths .... 5½¢
Solid Safe Cast Steel .... 4¢
Three and Five Ply Cast Steel .... 5¢

AGRICULTURAL IMPLEMENT CAST STEEL.
Fork & Rake, Crucible .. 4¢ | Corn Stalk Cutter, bev .. 4¢
Horse Rake Steel, cut to lengths, Crucible .... 5¢ | Beveled Hoe and Shovel Steel in Bars .... 4½¢
Hoe, Crucible .... 5¢ | Cruc. Plow St'l in Slabs. 4¢

Rolls and Castings.

Per lb.
Furnace and Floor Plates .... 1¾¢
Sand Rolls over 12 inches diameter .... 2¼¢
Sand Rolls 12 inches diameter and under .... 2¾¢
Roll Pinions over 12 inches diameter .... 2½¢
Roll Pinions 12 inches diameter and under .... 3 ¢
Housen and Rolling Mill Castings not otherwise specified .... 2¼¢
Spindles and Coupling Boxes .... 2 ¢
Squeezer Castings .... 2¼¢
Squeezer Pinions and Wheels .... 2½¢
Guide Plates .... 2½¢
Spur and Bevel Wheels, large .... 3 ¢
Spur and Bevel Wheels, small .... 3½¢
Pulleys, up to 30 inches .... 4 ¢
Pulleys, over 30 inches .... 3½¢
Engine Castings, light .... 4 ¢
Engine Castings, heavy .... 3½¢

White and Red Lead.

Strictly Pure White Lead in Oil, in Kegs. In lots of 500 lb and upward, 7¢ ⅌ lb: in lots less than 500 lb, 7½¢ ⅌ lb net; in 25-lb cans, packed in 100-lb cases, ½¢, and 12½-lb cans, 1¢, over keg price; in 1 to 5 lb cans, assorted, in 100-lb cases, 2½¢ over keg price.
Strictly Pure Dry White Lead in kegs, ⅌ lb .... 7 ¢
Strictly Pure Red *extra bright and fine*, in kegs ... 7 ¢
Strictly Pure Litharge, *powdered, ext. fine*, in kegs .. 7 ¢
Orange Mineral, *True*, in barrels, net 60 days and not subject either to rebate or freight equalization .... 8¾¢
Orange Mineral, *True*, in 100-lb kegs, net 60 days and not subject either to rebate or freight equalization 9
Terms: Note or acceptance at 60 days; or less 2½ % for cash if paid within 15 days from date of invoice on lots of 500 lb and over.
Freight equalized with all points where White Lead is made.

Window Glass.

Discount, 75 % *Single Strength*; 75 % *Double*. Prices current, ⅌ box of 50 feet.

Single Strength.

United Inches	Sizes.	AA.	A.	B.	C.
25	6 x 8 to 10 x 15	$8.75	$8.00	$7.50	$7.00
39	11 x 14 to 15 x 24	9.25	8.50	8.00	7.25
48	16 x 24 to 20 x 28	10.75	9.75	8.75	7 75
54	15 x 34 to 24 x 30	12.25	10.75	9.00	..
60	26 x 28 to 24 x 36	13.00	11.50	9.75	..
70	26 x 36 to 26 x 44	14.50	13.25	10.75	..
80	26 x 46 to 30 x 50	15.00	14.00	11.25	..
84	30 x 52 to 30 x 54	....	....	....	....
90	30 x 56 to 34 x 56	....	....	....	....
94	34 x 58 to 34 x 60	....	....	....	....
100	36 x 60 to 40 x 60	....	....	....	....
	Double Strength.				
25	6 x 8 to 10 x 15	13.25	12.25	11.25	10.5
39	11 x 14 to 15 x 24	14.50	13.25	12.50	11.2
48	16 x 24 to 20 x 28	17.25	15.75	14.00	....
54	15 x 34 to 24 x 30	19.75	17.25	14.50	....
60	26 x 28 to 24 x 36	21.00	18.50	15.75	....
70	26 x 36 to 26 x 44	23.25	21.25	17.25	....
80	26 x 46 to 30 x 50	24.00	22.50	18.00	....
84	30 x 52 to 30 x 54	25.75	23.25	19.25	....
90	30 x 56 to 34 x 56	27.75	25.00	21.75	....
94	35 x 58 to 34 x 60	29.25	27.75	24.00	....
100	36 x 60 to 40 x 60	33.25	30.00	27.75	....

Sizes above — $10 ⅌ box extra for every 5 inches.
An additional 10 per cent. will be charged for al glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.

Hubbard, & Co.'s Goods.

Axes, Single Bit, Lippincott .... per doz., $7.50
Axes, Single Bit, James & Co .... per doz. 6.50
Axes, Double Bit, Lippincott .... per doz., $12.50
Axes, Double Bit, James & Co .... per doz., 10.00
Drain Tools, list .... dis 20&7½&5 %
Hoes, Planters' and Scovill Pattern .... dis 50&10 %
Hoes, Handled, Square Eye, German .... dis 50&10 %
Handles, Cross Cut .... per doz., $2.25
Handles, Shovel, Bent, Bored, Riveted .. per doz., 2.00
Saws, Circular .... dis 50 %
Saws, Long .... dis 45 %
Saws, Cross-Cut, H. B. & Co., Champion, foot net .. $0.27
Saws, Cross-Cut, Lippincott, Champion, foot net .. $0.25
Shovels, list .... dis 20&7½&5 %
Spades, list .... dis 20&7½&5 %
Scoops, list .... dis 20&7½&5 %

BOSTON.

Reported by Bigelow & Dowse.

Ammunition.
Cartridges—
Rim Fire Cartridges ..... dis 60 %
Rim Fire Military Cartridges ..... dis 15 %
Cen. Fire Cartridges, Pistol and Rifle ..... dis 40 %
Cen. Fire Cartridges, Military and Sporting .. dis 30 %
Blank Cartridges, except 22 and 32 cal., an additional 10 % over above discounts.
Blank Cartridges, 22 cal $1.50
Blank Cartridges, 32 cal 3.00
Primed Shells and Bullets ..... dis 25 %
B. B. Caps, Round Ball $1.60
B. B. Caps, Conical Ball, Swaged 1.75
Primers—
Berdan Primers, all sizes, and B. L. Caps (for Sturtevant Shells) ..... 90¢
All other Primers, all sizes $1.10
Shells—
Paper Shot Shells, 1st and 2d or S. G. qual .. dis 25&5 %
Paper Shot Shells, Club, Rival, Climax .... dis 40&5 %
Paper Shot Shells, Star Brand ..... dis 50&5 %
Brass Shot Shells, first quality ..... dis 60 %
Brass Shot Shells, Club, Rival and Climax .... dis 65 %
Wads—
U. M. C. & W. R. A.—B. E., 11 up $2.00
U. M. C. & W. R. A.—B. E., 9&10 ..... 2.30
U. M. C. & W. R. A.—B. E., 7&8 ..... 2.60
U. M. C. & W. R. A.—P. E., 11 up 3.10
U. M. C. & W. R. A.—P. E., 9&10 ..... 4.00
U. M. C. & W. R. A.—P. E., 7&8 ..... 4.90
} dis 20 %

Anvil & Vise.

	10	20	30	40	
Cheney	$3.50	4.50	5.50	6.50	dis 25 %

Eagle, Fisher & Norris. No. 00, $1.75; 0, $2.25; 1, $2.75; 2, $3.25; 3, $4.00; 4, $4.50; 5, $5.25; 6, $6.00; 7, $6.50; 8, $7.25; 9, $8.25.
100 ℔ and over 10¢ ℔ ..... dis. 20 %

Augers & Bitts.
L'Hommedieu's Ship Auger ..... dis 15 %
Jenning's Bitts ..... dis 25 %
Cook's Bitts ..... dis 50&10 %
Griswold's Bitts ..... dis 60&10&5 %
Lewis's Patent Bitts ..... dis 40 %
Jennings' Pattern ..... dis 50&10&5 %

Awning Fixtures.
Dearborn's No. 1 ..... ℔ doz $10.50
Dearborn's No. 2 ..... ℔ doz 10.50
Dearborn's No. 3 ..... ℔ doz 13.50
} dis 25 %

Axes.
Blue Jackets ..... ℔ doz $7.00
Francis Axe Co ..... ℔ doz 7.00
Romer Bros ..... ℔ doz 6.50
Romer Bros., Polished Steel ..... ℔ doz 8.00

Axle Grease.
Belknap's tin boxes ..... ℔ doz $2.00
Belknap's 5 ℔ pails ..... ℔ doz 7.00
Belknap's 10 ℔ pails ..... ℔ doz 12.00
Belknap's 50 ℔ cans ..... ℔ ℔ .10

Ax Handles.
Oak Extra, 31 in., No. A ..... ℔ doz $2.50
Oak Extra, 34 in., No. A ..... ℔ doz 2.50
Oak Extra, 31 in., No. B ..... ℔ doz 2.00
Oak Extra, 34 in., No. B ..... ℔ doz 2.00
Oak Extra, 31 or 34 in., No. C ..... ℔ doz 1.40

Balances.—Chatillon's ..... dis 40&10 %

Barn Door Rail.
Cast Angle (for Anti-Friction Hangers) ..... ℔ ft. 2¢
Cast Half Round ..... ℔ ft., ⅝, 2½¢; ¾, 3¢
Wrought Round ..... ℔ ft., ½, 2½¢; ⅝, 3¢; ¾, 4¢

Bird Cages.
Hendry's Japanned ..... dis 40&10 %
Hendry's Brass ..... dis 33⅓&10 %

Blind Fasts.
No. 6 Fasts ..... ℔ C sets 6.00
Shedd's ..... ℔ C sets 6.00

Blind Hinges.—Mall. Hook, 3 holes .. ℔ C sets 7.00

Blocks.—Tackle ..... dis 50 %

Bolts.
Carriage.
Com. list June 10, 1884 ..... dis 75&10 %
Genuine Eagle, list October, 1884 ..... dis 75 %
Tire.
Common, list February 28, 1883 ..... dis 65&10 %

Borax.—Refined ..... ℔ ℔ 10¢

Boring Machines.
Eagle Upright, each ..... $5.50 list } dis 50
Eagle Angle, each ..... 6.75 list } & 10 %

Braces.
Barber's ..... dis 50 %
Spofford's ..... dis 50&10 %

Brackets.
Rick Bros. Bronzed Shelf ..... dis 50&10 %
Rick Bros. Store Shelf ..... dis 40&10 %

Bright Wire Goods.
Regular list ..... dis 80 %

Butts.—Union Fast Joint ..... dis 60&10 %
Union Loose Joint ..... dis 70&10 %
Union Japanned Acorn ..... dis 70&10 %
Union Silvered Acorn ..... dis 70&10 %
Union Boston Finish ..... dis 80 %
Union Spiral Spring ..... dis 40 %
Wrought Brass ..... dis 75&10 %

Carriage Bolts.—Eagle Norway ..... dis 75 %
Common, new list ..... dis 75&10 %

Cards.
Watson's make Horse & Curry .... dis 10 %
Watson's Cotton ..... dis 10 %
Watson's Wool ..... dis 10 %
} Rev. List, Aug., 1883.

Carpet Sweepers.
Welcome Rubber Roll ..... ℔ doz $19.00
Welcome Cog Wheel ..... ℔ doz 17.00

Casters.—Bed and Table ..... dis 50&10 %

Chain.
Coil 3-16 ..... ℔ ℔ 8¢
Coil ¼ ..... ℔ ℔ 6¢
Coil 5-16 ..... ℔ ℔ 5¢
Coil ⅜ ..... ℔ ℔ 5¢
Coil 7-16 ..... ℔ ℔ 4½¢
Coil ½ ..... ℔ ℔ 4½¢

Chalk.—White, Carpenter's ..... ℔ gross 55¢
Red, Carpenter's ..... ℔ gross 75¢
Blue, Carpenter's ..... ℔ gross 90¢
Crayons ..... 12¢

Chisels.—Peck, Stow & Wilcox ..... dis 70&10&10 %
Underhill, Framing ..... dis 40 %
Buck's Chisels ..... dis 30 %

Coal Hods.—Galv'd, New List ..... dis 60&10&10 %
Japanned, New List ..... dis 60&10&10 %

Cocks, Brass.
Racking ..... } dis 55&10 %
Globe ..... }
Plain Ribbs ..... }
Compression, Eastern Mfg. Co.:

	¼	⅜
To Screw ..... ℔ doz	$2.50	3.50
To Solder ..... ℔ doz	2.50	3.50

Coffee Mills.—New List ..... dis 45&10 %

Copper Rivets ..... dis 50&10 %

Cordage.
Manila, usual trade dis 1¢ ℔ ℔ ..... ℔ ℔ 13¢
Sisal, usual trade dis 1¢ ℔ ℔ ..... ℔ ℔ 10½¢

Cow Ties.
No. 30 3 ft. No. 6 Wire, with toggle ..... ℔ doz $3.80
No. 35, 3 ft. No. 6 Wire, with snap ..... ℔ doz 4.00
No. 40, 3½ ft. No. 6 Wire, with toggle ..... ℔ doz 4.30
No. 45, 3½ ft. No. 6 Wire, with snap ..... ℔ doz 4.50
No. 50, 4 ft. No. 4 Wire, with toggle ..... ℔ doz 4.75
No. 55, 4 ft. No. 4 Wire, with snap ..... ℔ doz 5.00
No. 60, 4½ ft. No. 3 Wire, with toggle ..... ℔ doz 5.60
No. 65, 4½ ft. No. 3 Wire, with snap ..... ℔ doz 5.80
} dis 50&10 %

Crow Bars.—Cast Steel ..... ℔ ℔ 5¢

Cutlery.
Pocket American Shear Co.'s ..... net
Pocket Eastern Shear Co.'s ..... net
Butcher Knives, Wood's, Lap Bolster, Square Handle ..... dis 40 %
Steak Knives ..... dis 40 %
Lap Bolster, Oval Handle ..... dis 40 %
Sticking ..... dis 40 %
Skinning ..... dis 40 %
Butcher, Common Round Handle, Wood's .... dis 40 %
Shoe Knives, Wood's ..... dis 30 %

Dog Collars.
Embossed Gilt, Pope & Stevens' list ..... } dis 40 %
Leather, Pope & Stevens' list ..... }
Brass, Pope & Stevens' list ..... }

Door Springs.—Torrey's Rod ..... ℔ doz $1.50
Gem Coil, new list ..... dis 20 %
Crown ..... ℔ doz $1.00
Warner's ..... ℔ doz 1.50

Drawing Knives.
Kimball's Solid Steel ..... ℔ inch 7½¢
Eastern Mfg. Co.'s Solid Steel .. ℔ inch 7½¢ dis 20 %

Drills.—Morse Twist Drill Co.'s.
Bit Stock Drills ..... }
Wire Gauge Drills ..... } dis 50 %
Jobbers' and Letter Drills ..... }

Drill Chucks.
Morse's Beach Patent ..... each $8, dis 20 %
Morse's Adjustable ..... each $7, dis 20 %

Emery.

	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF, F, FF.
Kegs, ℔ ℔	4 ¢	4 ¢	2½¢
½ kegs, ℔ ℔	4½¢	4½¢	2¾¢
¼ kegs, ℔ ℔	4¾¢	5 ¢	3¼¢
10 ℔ cans, ℔ ℔	7 ¢	7 ¢	5 ¢

Enameled Ware.
Enameled Kettles ..... dis 50 %
Enameled Sauce Pans ..... dis 25 %

Files.
American File Co. ..... dis 60 %
Nicholson File Co. ..... dis 60 %

Fly Traps.
Paragon ..... ℔ doz $2.00
Balloon ..... ℔ doz 1.75

Forks.
Withington & Cooley Mfg. Co.'s ..... dis 60&10 %

Freezers.
Packer's ..... dis 60 %
Gouche's ..... dis 60 %

Grub Hoes.
Iron City Tool Co.'s ..... dis 60 %

Hammers.
Maydole's ..... dis 25 %
C. Hammond's ..... dis 40 %

Hangers.
Common Hangers ..... dis 50&10 %
Common Rollers ..... dis 50&10 %
Faultless Hangers ..... dis 40 %
Victor Hangers ..... dis 50 %
American Parlor Door, $6 set ..... dis 20&10 %

Hatchets.—C. F. Dowse, new list ..... dis 40 %
Underhill ..... dis 40 %
Eastern Tool Co.'s ..... net

Hay Knives.—Lightning ..... $18.00, dis 10 %

Hinges.—Strap and T (new list) ..... dis 65 %
Providence Plate ..... ℔ ℔ 5 ¢
Wrought Screw Hook ..... ℔ ℔ 5 ¢

Hoes.—W. & C. Mfg. Co.'s ..... dis 60&10 %

Hooks and Staples.—Brewer's (new list) .. dis 70 %

Horse Nails.

	No. 6	7	8	9	
Putnam Pointed	$0.24	.22	.21	.20	.....5&7 %
Bridgewater	.28	.21	.20	19.	.....30 %

Knobs ..... dis 45 %

Lanterns.—Tubulars, No. 0 ..... ℔ doz $7.50

Lawn Mowers.
Continental ..... dis 50&5 %
Quaker City ..... dis 50&5 %
Philadelphia Keystone ..... dis 50&5 %

Lead.—Sheet ..... ℔ ℔ 8¢
Pipe ..... ℔ ℔ 7¢

Locks.—Norwalk ..... dis 45 %
Eagle Cabinet ..... dis 40 %
Eagle Trunk ..... dis 15 %
Mallory, Wheeler & Co. ..... dis 66⅔ %

Manure Forks.—W. C. & Co ..... dis 60&10 %

Mattocks.
Long Cutter, $16.00 ℔ doz ..... }
Short Cutter, $15.50 ℔ doz ..... } dis 60 %
Pick Cutter, $16.00 ℔ doz ..... }

Measuring Tapes.—Eddy's ..... dis 20 %

Meat Cutters.
Enterprise ..... dis 30

Nos.	10	12	22	32	42
Each	$3.00	2.50	4.00	6.00	10.00

Nails. ..... ℔ keg $2.35
Wire Nails, list April 13, 1886 ..... dis 50&5 @ 50&10 %
Wire Carpet Nails ..... dis 60 %

Oilers.—Zinc and Tin ..... dis 60 %
Brass and Copper ..... dis 50 %
Draper's Common, ℔ dos., $3.75; Patent, ℔ doz $4.50
Thompson's ..... ℔ doz $3.00
Malleable Iron ..... dis 10 %

Ox Bows.—Extra finished and varnished .... dis 15 %
1⅛ in., ℔ doz. pair .. $7.00 | 2 in., ℔ doz. pair .. $10.00
1⅜ in., ℔ doz. pair .. 9.00 | 2⅛ in., ℔ doz. pair .. 12.00

Paper.—Common Tarred Sheathing ..... ℔ ℔ 1¾¢
Eagle Brand Tarred Sheathing ..... ℔ ℔ 2 ¢
Common, Dry Sheathing ..... ℔ ℔ 1¾¢
Eagle Brand Dry Sheathing ..... ℔ ℔ 2½¢
Neponset Water Proof ..... ℔ ℔ 3½¢

Picks.
I. C. T. W., Adze Eye, 6 to 7 ℔ $13.00 ..... dis 60 %

Planes.
Auburn Tool Co., Bench ..... dis 20 %
Auburn Tool Co., Fancy ..... dis 15 %
Auburn Tool Co., English Iron ..... dis 15 %
N. Y. Tool Co., Bench ..... dis 25 %

Plated Ware.—Rogers & Bro ..... dis 50&10 %

Pliers.—Vom Cleff & Co.'s ..... net list
Button's Wire Pliers ..... dis 33⅓ %

Plumb & Levels.—Stanley R. & L. Co .. dis 70&10 %

Potato Diggers.
W. C. & Co., reduced list ..... dis 60&10 %

Pulleys.—Acme or Excelsior, 1¾ in ..... ℔ doz 22¢
Acme or Excelsior, 2 in ..... ℔ doz 24¢

Pumps.—Union Manufacturing Co.
Iron Cistern ..... dis 50 %
Iron Pitcher Spout ..... dis 60 %
Copper ..... dis 30 %

Rivets.—In 5 ℔ papers ..... dis 45 %
Burrs ..... dis 50 %
Copper ..... dis 60 %

Razors.
Genuine Swedish ..... ℔ doz $13.50

Rope.—Manufacturers' list, February 6, 1886
Manila ..... ½ inch and larger ℔ ℔ 13 ¢
Manila ..... ⅜ inch ℔ ℔ 13½¢
Manila ..... ¼ and 5-16 inch ℔ ℔ 14 ¢
Manila, Tarred Rope ..... ℔ ℔ 12½¢
Manila, Hay Rope ..... ℔ ℔ 13 ¢
Sisal ..... ½ inch and larger ℔ ℔ 10½¢
Sisal ..... ⅜ inch ℔ ℔ 11 ¢
Sisal ..... ¼ and 5-16 inch ℔ ℔ 11½¢
Sisal, Hay Rope ..... ℔ ℔ 10½¢
Sisal, Tarred Rope ..... ℔ ℔
Sisal, Single Ply Lath Yarn ..... ℔ ℔
Cotton Rope ..... ℔ ℔ 15&18¢ net
Jute Rope ..... ℔ ℔ 7¢
} Dis 10 %

Rules.—Stanley, Boxwood ..... dis 75&10 %
Stanley, Ivory ..... dis 50&10 %

Sad Irons.—Common ..... ℔ ℔ 3 ¢
Laundry ..... ℔ ℔ 6¼¢
Tailors' Geese ..... ℔ ℔ 6 ¢
Enterprise "Potts" ..... dis 40 %

Sandpaper.—Baeder & Adamson ..... dis 20 %

Sash Weights.—Patent Eye ..... ℔ ℔ 1¼¢

Saws.—Hand Saws, Disston's ..... dis 20 %
Cross-Cut Saws.
Disston's, Common Tooth ..... ℔ foot 68¢, dis 45 %
Disston's Great American Tooth .. ℔ foot 68¢, dis 45 %
M. B. & D., Hand Saws ..... dis 33⅓ %
Richardson Bros ..... dis 25 %

Saw Blades.—Disston ..... dis 20 %
Welch & Griffith, Extra ..... ℔ doz $7.20
Welch & Griffith, No. 2 ..... ℔ doz 6.00

Scales.—Fairbanks ..... dis 20 %

Screen Window and Door Frames.
Hart's Screen Frames, No. 1 ..... ℔ doz $1.75
Hart's Screen Frames, No. 2 ..... ℔ doz 2.25
Hart's Screen Doors, No. 10 ..... ℔ doz 7.50

Screws.
Wood Screws List February 15, 1886.
Flat-Head Iron ..... dis 75&10 %
Round-Head Iron ..... dis 70&10 %
Flat-Head Brass ..... dis 75 %
Round-Head Brass ..... dis 70 %
Flat-Head Bronze ..... dis 75 %
Round-Head Bronze ..... dis 70 %
Machine—
Flat-Head, Iron ..... dis 60 %
Round-Head Iron ..... dis 55 %

Scythes.
Blood's Clipper Scythes ..... ℔ doz $6.50
Nolin's Clipper Scythes ..... ℔ doz 7.00
Nolin's Solid Steel Scythes ..... ℔ doz 9.00
Emerson Clipper Scythes 7.00
Emerson Solid Steel Scythes 9.00

Shears.—American Shear Co., new list ..... dis 70 %

Shot.—Le Roy ..... $1.60 bag.

Shovels.—O. Ames, new list ..... dis 20 %
O. Ames, other brands, new list ..... dis 20 %

Sinks.—Magee Patent ..... dis 30 %

Snow Shovels $3.75

Skates.—Eastern Acme.
No. 5, Steel Runners ..... ℔ pair $1.00
No. 7, Steel Runners, hardened ..... ℔ pair 1.50
No. 10, Steel Runners, hardened, Nickel Plated ..... ℔ pair 2.00

Stocks and Dies.—King's ..... dis 10&5 %

Tacks.—Eastern Mfg. Co.
American Iron Carpet Tacks, all kinds .. dis 65&10 %
Steel Carpet Tacks, all kinds ..... }
Swedes Iron Carpet Tacks, all kinds ... }
Swedes Iron Tacks ..... } dis 60&10 %
Swedes Iron Upholsterers' Tacks ..... }
Tinned Swedes Iron Tacks ..... }
Tinned Swedes Iron Upholsterers' Tacks }
American Iron Cut Tacks ..... dis 55&10 %
Copper Tacks ..... }
Copper Finishing and Trunk Nails ..... }
Cigar Box Nails ..... }
Finishing Nails ..... }
Hungarian Nails and Miners' Tacks ... } dis 50&10 %
Gimp and Lace Tacks ..... }
Tinned Gimp and Lace Tacks ..... }
Trunk and Clout Nails ..... }
Tinned Trunk and Clout Nails ..... }
Basket Nails ..... }
Chair Nails ..... }
Common and Patent Brads ..... dis 45&10 %

Transom Lifters.
Wollensak's Patent Iron Bronzed ..... dis 50 %

Traps.—Game.
Newhouse ..... dis 35 %
Oneida Pattern ..... dis 60&10&10&70 %
Game, Blake's Patent ..... dis 40&10&5 %

Vises.—Simpson's Adjustable ..... dis 33⅓ %
Howard Vise Co ..... dis 33⅓ %
I. C. T. Co.'s Blacksmiths' ..... dis 50&10 %

Weather Strips.
Richmond Bottom Strip, Walnut ..... ℔ doz $5.00
Richmond Bottom Strip, imit. Walnut ... ℔ doz .....
Richmond Bottom for Double Doors ..... ℔ doz 15.00
Packer's ..... ℔ doz 4.50
Underwood's ..... ℔ pair, plain $3.75, rubber 4.00

Wire Cloth.—"Clinton" ..... ℔ sq. ft. 2 ¢

Wire Fence.
Buffalo Painted Barbed ..... ℔ ℔ 4 ¢
Buffalo Galvanized Barbed ..... ℔ ℔ 4½¢

Wrenches.—A. G. Coe's ..... dis 60 %
Girard Mfg. Co ..... dis 60&10 %
Girard Agl ..... dis 70&10 %
"Always Ready" ..... dis 25 %

Wringers.
Novelty for Common Tubs No. 2—10-in .. ℔ doz $27.00
" " " No. 3—11-in .. ℔ doz 31.50
Excelsior for Stationary Tubs No. E—10-inch ..... ℔ doz 39.00
Excelsior for Stationary Tubs No. F—11-inch ..... ℔ doz 43.50
Excelsior with Folding Bench No. A—10-inch ..... ℔ doz 48.00
Excelsior with Folding Bench No. B—11-inch ..... ℔ doz 52.50
Novelty Set Tub, E ..... ℔ doz .....
Universal ..... ℔ doz 27.00
Eureka ..... ℔ doz 30.00

Zinc ..... ℔ ℔ 5½¢

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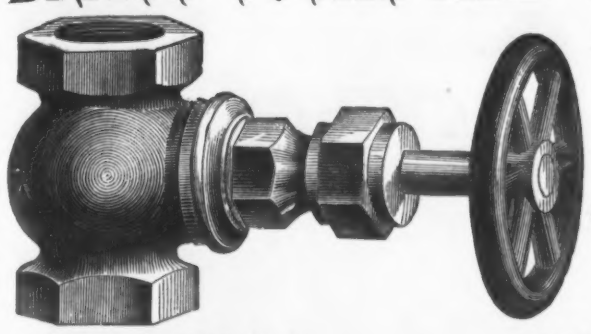

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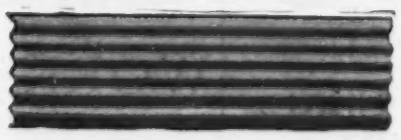

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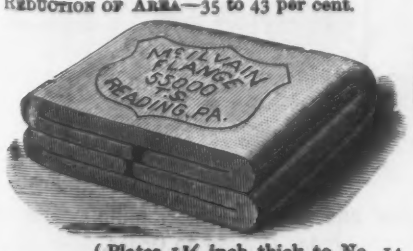
REDUCTION OF AREA—35 to 43 per cent.



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These tools have been made by us for a number of years, and are well known as the leading Ratchet Drill in the market. They are manufactured of the *best material* and in a *thorough* manner. The screw is protected with a round sleeve, keeping dirt and grit from cutting the thread.

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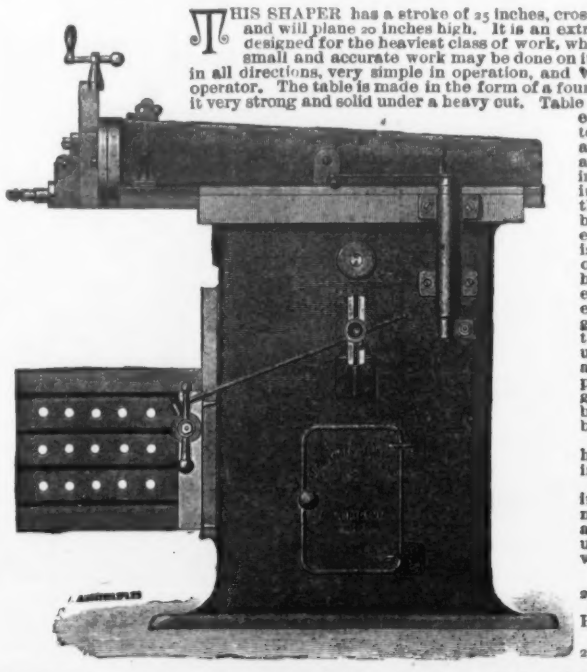

THIS SHAPER has a stroke of 25 inches, cross-feed of table 27 inches, and will plane 20 inches high. It is an extra heavy machine, and is designed for the heaviest class of work, while at the same time very small and accurate work may be done on it. It has automatic feed in all directions, very simple in operation, and within easy reach of the operator. The table is made in the form of a four-sided box, which makes it very strong and solid under a heavy cut. Table will move to the left far enough to take in 8½ inches to center of machine, and tool can be set at an angle to plane 10 or 11 inches wide. A bar of 4-inch iron may be passed through under the cutter bar for key seating or other work. The cutter bar is driven by two rack gears of large diameter, on a heavy steel shaft supported on bearings at each end. Driving pinion and gear are on the outside of the machine, allowing the use of extra large gear and increased speed of pulleys, and consequent gain of power on cutter bar. All pinions made of best machine steel.

Driving and feed shafts have extra outside bearings or supports.

The machine has patent improved friction driving movement, and we guarantee cutter bar to work up to a line and reverse without jar or noise.

Weight of Machine, 2700 pounds.

Size of Tight and Loose Pulleys on C. Shaft, 12 x 3.

Speed of Counter Shaft, 250 revolutions.

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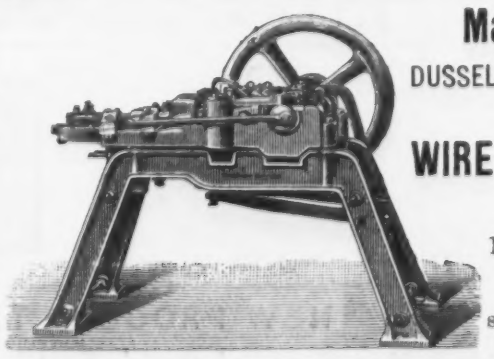
Improvement patented April 28, 1885, of which we are the sole manufacturers, has been tested with the most celebrated knives of other makers, and has proved an easier and faster Cutter than any other. Its special excellence consists in the chisel-edge tooth shown in the engraving. It may be used for cutting hay in the mow, stack and bale; also for ditching, cutting peat, or any other work for which a hay knife is used. It can be readily ground by the most inexperienced, as it requires to be ground only on one side. Should a tooth break, all that is necessary to replace the damage is to grind it once and a new chisel-tooth appears. It can ordinarily be sharpened with a common scythe stone. Try one and you will give it the preference.



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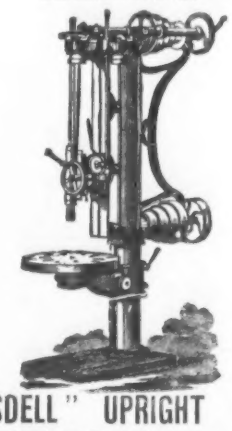

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The only Vapor Furnace that has proven an absolute success for bench and outdoor use. The Dangler Combination Furnace can now be seen and bought in all the leading cities and towns throughout the United States. For further information address

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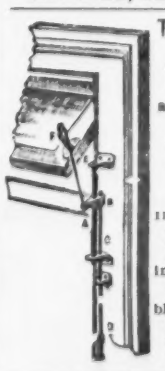

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answers equally well for Transoms.

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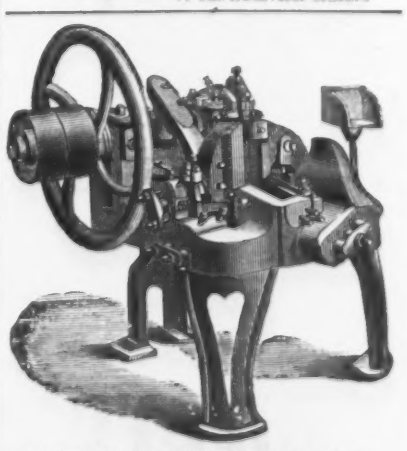

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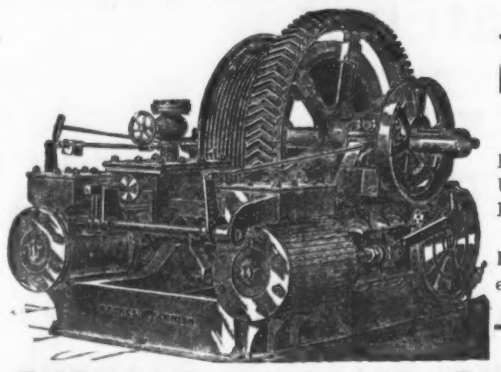

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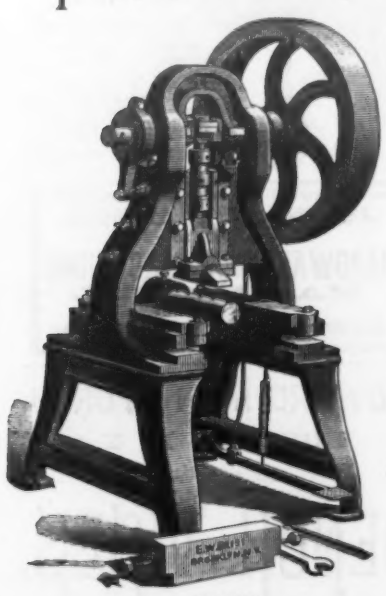

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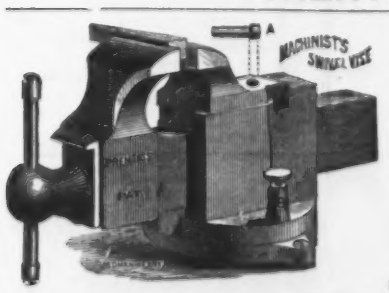

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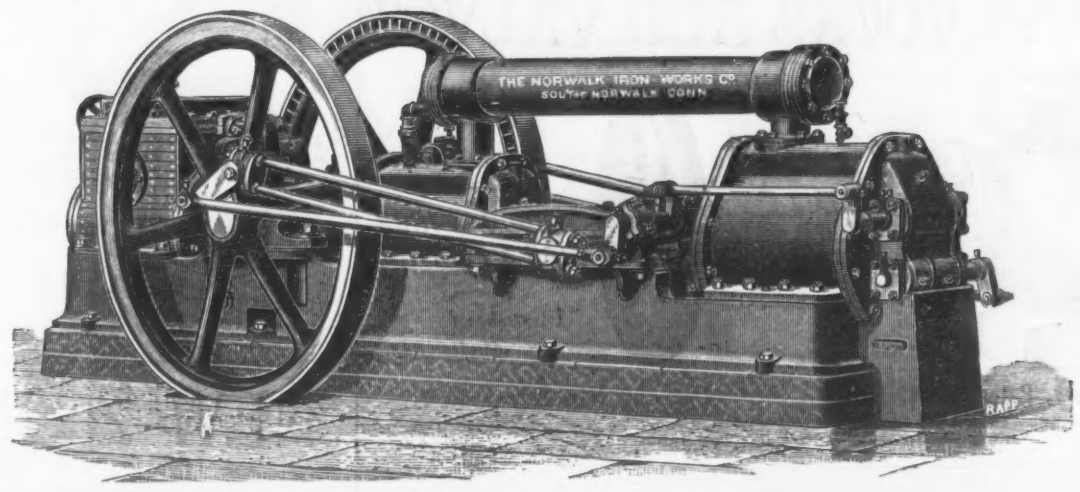

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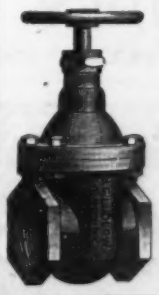

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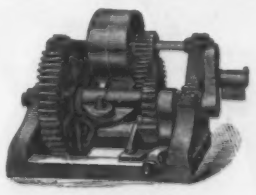

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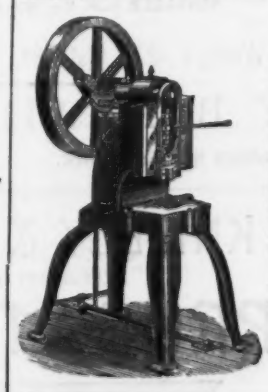

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IT WILL PAY YOU.

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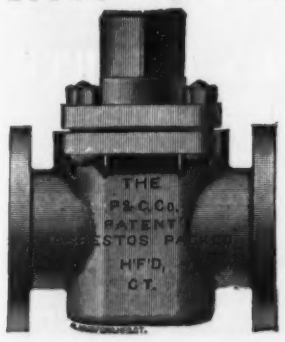
—FOR—

STEAM, GAS, AIR, AMMONIA, Etc.



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This Cock always opens and closes easily and remains **absolutely TIGHT** where all other Valves or Cocks will leak.
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All Goods Warranted to Give Satisfaction.

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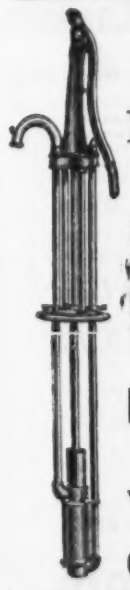

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Producing a continuous flow of water, both in suction and discharge. Works smoother and easier than any other force pump in the market. Has Seamless Drawn Brass Cylinders and no stuffing boxes. Never freezes in winter, and is not liable to get out of order. With Hose Attachment it is valuable as a fire protection, and for sprinkling lawns, gardens, &c. It is specially adapted for all kinds of wells—dug, drilled or driven—and for pumping water long distances from springs.

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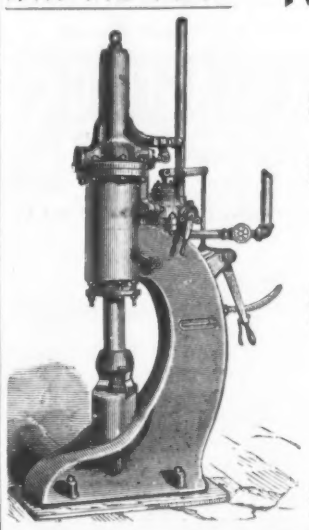

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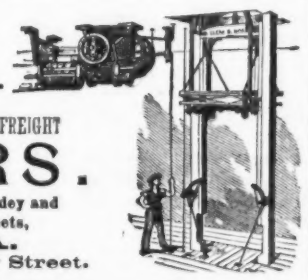

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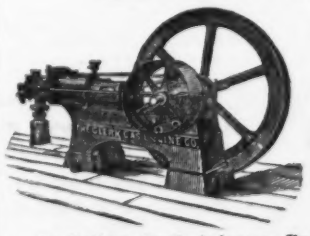

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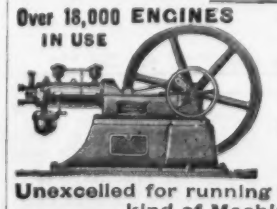
Over 18,000 ENGINES IN USE



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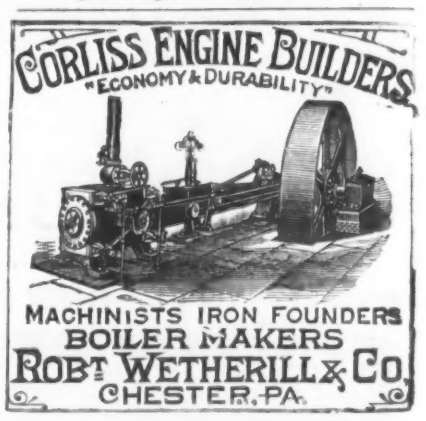

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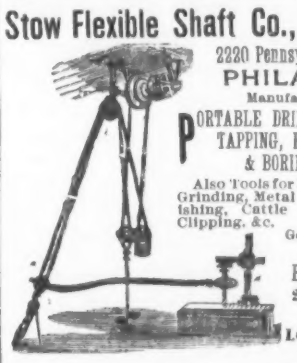

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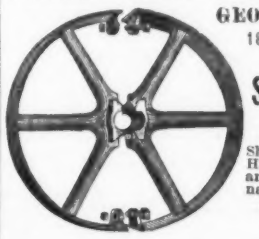

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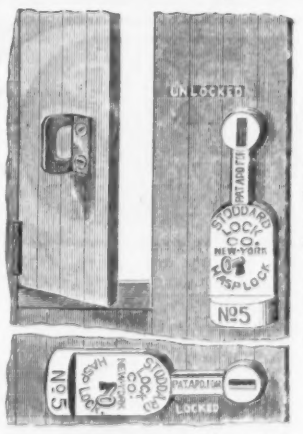

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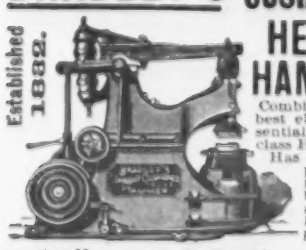

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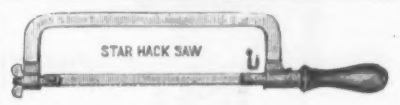

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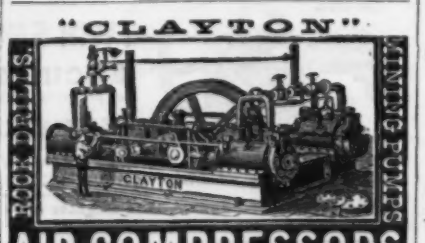

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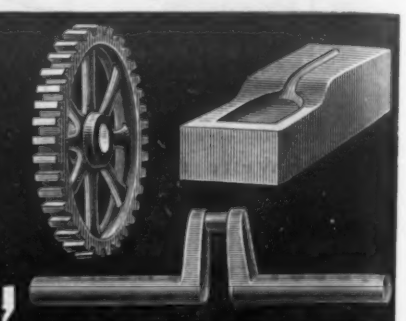

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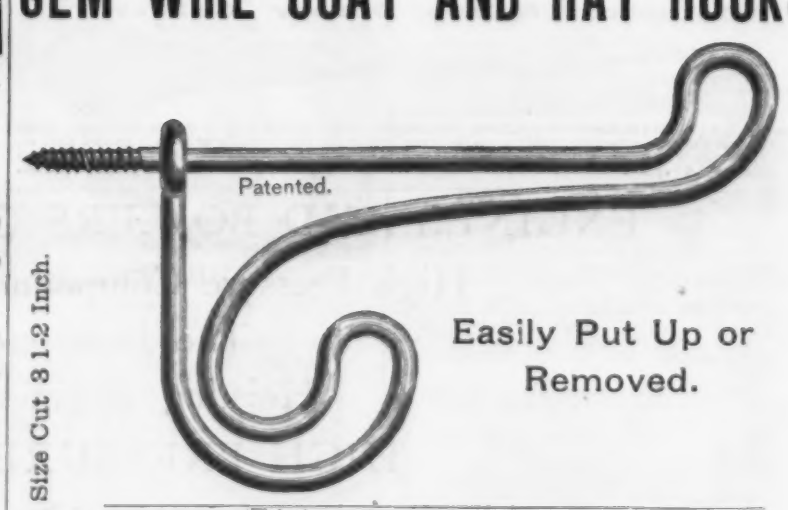

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3 inch.....	70	2.55	170	2.40	270	3.40	770	6.60
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